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A Comparative Ecological Study of the Grasses and the Geology of Tangipahoa Parish, Louisiana.

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A COMPARATIVE ECOLOGICAL STUDY OF THE GRASSES AND THE GEOLOGY OF TANGIPAHOA PARISH, LOUISIANA

A Dissertation

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by
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ABSTRACT

This is an ecological investigation of the grasses of Tangipahoa Parish, Louisiana. The objectives were to determine the correlations between plant distribution and the geology of the area, and to compile an annotated catalog which might serve toward a flora for the parish. Five geological formations of Pleistocene origin are recognized in this study.

Emphasis is placed on the grasses in this work. The author collected approximately 1800 specimens and compiled an annotated catalog containing 262 species, 118 of which are grasses.

Pertinent field notes such as flowering dates, relative abundance, and location according to geological formations are included. Photographs showing typical habitats and field stations are also included.

INTRODUCTION

The purposes of this study were (1) to investigate the possible correlations between plant distribution, in particular the grasses, and the geological formations within Tangipahoa Parish, Louisiana, and (2) to assemble an annotated catalog of grasses occurring on selected sites within the Parish.

In 1817, William Darby noted that, "Perhaps few countries on the globe would admit a greater variety of meadow grasses than Louisiana, but this invaluable part of agriculture has not been attended to with care proportionate to its importance."

The longleaf pine belt originally ranged from the extreme southeastern corner of Virginia southward to Florida and westward to Texas. At the present time its range has been somewhat diminished. That portion of the longleaf pine belt in southeastern Louisiana and adjacent Mississippi constitutes the western part of the Southeastern Evergreen Forest Region, and the most prominent vegetational feature of much of the area is the preponderance of evergreen trees.

All of the virgin timber has been harvested, but an unusual amount of reforestation has taken place in this section of the country.

Some drainage is afforded these pine woods by several small streams where the vegetation is primarily bottomland hardwood with many ericaceous shrubs.

This study was made in Tangipahoa Parish, Louisiana, an area which is included in the original Florida Parishes. Tangipahoa Parish comprises a portion of that physiographic section of Louisiana which geologists term, the Quaternary Lowlands.

Ecologists recognize that geologic climates and barriers have been paramount in determining what vegetation may develop under a given environment. It follows then, that a correlation could be made between plant distribution and geology, with sufficient field investigations. Several workers have pointed out that the geology of Louisiana is fairly well known, but that plant distribution as related to geology is wholly inadequate.

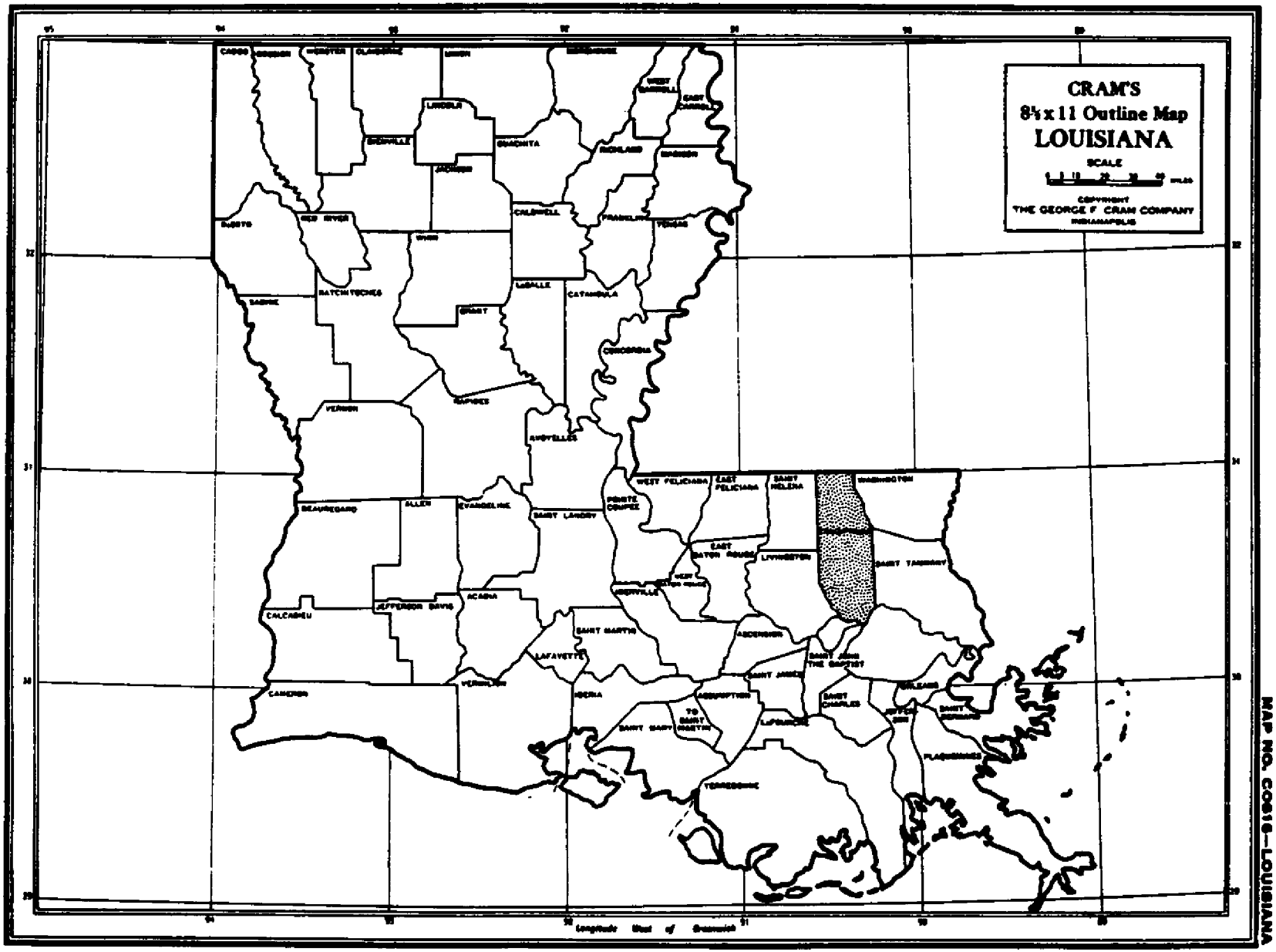


Figure 1. Location of Tangipahoa Parish

HISTORICAL REVIEW

A number of studies related to the flora and geology of Louisiana have been made. Significant workers among these were Brown (1929, 1944, 1945); Fisk et al (1938); Holland (1944); Penfound (1944); and Penfound and Watkins (1937). However, no detailed study of this nature for Tangipahoa Parish has been made.

Geology, Physiography and Soils

According to Anderson (1931), all of Louisiana falls within the groups known as the red and yellow soils, which extend from South Virginia into East Texas, and north into South Arkansas and Tennessee. Therefore, the upland soils of this State are very closely related, based upon parent material and environmental conditions.

Marbut (1935) reported that the soils along the coast from New Jersey to West Texas, as far north as the southern part of Arkansas and extending north on the east side of the Mississippi Valley, taking in the west portion of Alabama and a narrow strip of Tennessee, except for the valleys, developed from the same type of parent material, which consisted of sandy clay and limestone.

Fisk (1938) reported the predominant physiographic elements in the Gulf Coastal Plain as wide seaward-sloping surfaces which form distinctive topographic belts more or less parallel to the alignment of

present coastal marshes. These coastwise surfaces have been referred to under numerous terms such as "terraces," "coastal terraces," "deltaic plains," and "Pleistocene delta remnants." The prevailing term in use at present however is, "formation." Fisk divided the area into four terraces (formations), namely: Prairie, Montgomery, Bentley, and Williana (youngest to oldest).

Penfound (1944) stated that the southern half of Louisiana is divided fairly equally between Pleistocene sediments in the upper part and Recent deposits in the coastal strip, especially in the southeastern corner.

Holland (1944) distinguished two major physiographic areas in Louisiana; an older which he termed the Tertiary Uplands and a younger, the Quaternary Lowlands, comprising four Pleistocene terraces and several Recent alluvial surfaces. Holland characterized two sections upon topographic distinctions resulting from a difference in the nature of the underlying sediments.

All of the units of the Quaternary Lowlands are somewhat similar, in that they are the surfaces of Quaternary streams or deltaic deposits. They differ in amount of relief and degree of slope, and in some cases, the composition of the underlying sediment differs.

Holland (1944) further pointed out that the sections are not separable along a sharp line of demarcation even though they are distinct topographically. Remnants of the younger surface occur as flood plains or terraces along streams well up into the older surfaces.

The origin of the four Pleistocene terraces is due to two factors, according to Holland (1944). The first is eustatic changes in sea level as a result of Pleistocene glaciation. The second is the slow but constant tilting, probably resulting from isostatic adjustments in the Gulf Coast area.

Holland (1944) reported that all surfaces in the Quaternary Lowlands Section other than the terrace units are either Recent flood plains or deltaic plains. Recent flood plains are those surfaces that have been formed through alluviation within recent times.

A brief description of the terrace units (formations), taken from the work of Holland (1944) follows.

Williana Formation

This formation is an outcrop which was deposited during the Aftonian interglacial stage. This is the oldest formation and has undergone the most erosion. It slopes south or southeastward at the rate of about eight feet per mile. Materials underlying the surface have a rather coarse composition. It is composed of gravels derived from Paleozoic areas plus coarse sand, silt, and some clay. It has more relief than any other unit in the Quaternary Lowlands and a rolling topography with elevations from 200 to 300 feet.

Bentley Formation

This deposit is an outcrop of the Bentley Formation which was formed during the Yarmouth interglacial stage. It is found south and

southeast of Williana with a slope of approximately five feet per mile. It possesses a rolling surface developed on sands, silts, clays, and less gravel than in the Williana.

Holland (1944) noted that this formation originally supported one of the largest acreages of longleaf pine in the state.

Montgomery Formation

The Montgomery Formation was laid down during the Sangamon interglacial stage. It is found south and southeast of Bentley with a slope in the same direction at the rate of about two feet per mile. This formation is quite flat compared to the Bentley Formation, with large, poorly drained areas.

Prairie Formation

This unit was formed during the Peorian interglacial stage and is the youngest of the Pleistocene terraces. It slopes to the south at about one foot per mile and is more extensive than the other formations.

This formation is characterized by a higher percentage of clay and less coarse sediments than is found on the other areas described. The poorly drained surface supports a greater number of deciduous trees and prairie vegetation than does the other formations.

Deltaic Plain (Recent)

This area includes the delta of the Mississippi and the coastal marshes along the Gulf. Lake Pontchartrain is an example of a delta-flank

depression which occurs as a result of the interaction between sedimentation and subsidence. The influence of salt water is quite apparent for some distance inland due to the flatness of the region.

Lytle and Sturgis (1962) recognized four general soil areas in Tangipahoa Parish: (1) the Lexington-Providence-Bude association includes the Loessial Hills soils developed from a shallow mantle (2 to 3 feet thick) of silty materials over sandy materials of the Pleistocene epoch; (2) the Caddo-Beauregard-Hammond-Wrightsville soils which are level or nearly level; (3) the Sharkey-Tunica-Swamp clays which include the backswamps and backlands of the Mississippi River; and (4) the Bibb-Ochlockonee-Chastain-Waverly association which includes the bottom lands of the smaller streams.

Vegetation

Before the work of Darby (1817) the State of Louisiana was naturally divided into three sections; the southeast, the southwest, and the northwest. The Parish of "Tangipahoa" did not exist during this period, but it now forms a part of what was known in earlier times as "West Florida."

In the geographical description of the State of Louisiana, Darby (1817) gave the following description of "West Florida,"

> The tract between the Mississippi and Pearl, bordering on the delta of the former, is divided into two distinctive portions. The southern section, twenty miles wide and seventy long, is an almost unbroken plain, rising like the prairies of Opelousas and Attacapas by a very slow acclivity, from its south to north extremity. This plain is covered in the whole length by a thick

> forest. The most remarkable trees are, the liquidambar styraciflua, pinus taeda, pinus rigida, cupressus disticha, ulmus aquatica, acer rubrum, quercus tinctoria, quercus alba, quercus virens, quercus aquatica, quercus phellos, juglans amara, juglans porcina, nyssa sylvatica, nyssa aquatica, fraxinus tomentosa, salix nigra, celtis crassifolia, gleditsia triacanthos, and diospiros virginiana.
>
> The cornus florida abounds, as does also the arundo gigantea. The laurel magnolia also abounds over the whole extent of this plain.
>
> The soil of this plain is of second rate quality, though alluvial; evidently owing its origin rather to the adjacent pine hills, than to the more fertile spoils of the Mississippi.
>
> The second section is very nearly of equal area with the foregoing; but differs essentially in most other respects. The surface is broken, often considerably elevated, the soil diversified in quality; near the streams often fertile, but a much greater proportion covered with pine, (pinus rigida) and sterile. Springs of excellent water become frequent, the creeks and rivers fine bold streams of very pure limpid water.

State Land Office records of the original land surveys conducted by C. J. Cabell (1849), J. C. Taylor (1848), and Silas Taylor (1850) showed that the upper two-thirds of Tangipahoa Parish was covered predominantly by pine timber.

Portions of the southern one-third of the Parish were surveyed by Weightman and Taylor (1845) and their work indicated a mixture of pine and hardwood on the Prairie Terrace, as one approaches the marsh.

Joseph Gorlinski (1860) ran a six mile line due east from the shore of Lake Maurepas through the southern end of Manchac Swamp and recorded cypress, tupelogum, and mixed hardwoods.

In 1929 Brown (1929) reported that relatively little systematic botanical work had been done in Louisiana and contributed a list of

plants to be considered as extending the published distribution of species. At this time Brown reported Andropogon tracyi Nash, which was collected in pine woods near Kleinpeter.

It has been suggested by some workers that a very close correlation could be observed between natural vegetation and geological formations if adequate field investigations were pursued. Cuyler (1931) has reported on just such a correlation in his investigations on the Cretaceous formations of Texas. He found that he could recognize at least seven out of twelve formations studied merely by the plant community found thereon. These formations varied from cactus through mesquite and xeric oaks to an elm community.

West (1934) made a study on canebrakes (Arundinaria) of the Southeastern United States as related to geographical distribution. One of the bamboo communities studied was located in Tangipahoa Parish, Louisiana.

Penfound and Watkins (1937) made a phytosociological study in the pinelands of adjoining St. Tammany Parish in which numerous species of grasses were listed. Of the 168 species of plants listed by these workers, they considered the grasses to be the most important, not only in number of species (25 per cent of the total) but also in number of individuals, in frequency and in total coverage. They further stated that, "The cut-over areas and the herbaceous strata in the virgin forests are 'grasslands' in all important respects except that the trees do control the density of the grasses to some degree."

A collection of grasses from Tangipahoa Parish was made by Smith (1938) for the purpose of studying their root systems with special emphasis on their soil conserving characteristics. Five species were finally selected for detailed study with characteristics best suited for erosion control purposes.

A collection of plants from Louisiana was made by Correll and Correll (1941) in the summer of 1938. In this collection, eleven species of grasses were listed from Tangipahoa Parish.

Brown (1944) noted from field investigations that relationships exist between certain plants or plant assemblages and the geology and physiography of the state.

Brown stated that, "Early settlers used what we may term indicator species in selecting farm lands. Lands which produced magnolia and cane were considered good; whereas pine lands were considered nearly worthless."

It is further noted by Brown (1944) that it is sometimes difficult to recognize the correlation between vegetation and geology due to variation in vegetation on the same terrace. For example, the Prairie Terrace extends eastward from Baton Rouge through Covington to the Pearl River. In the vicinity of Baton Rouge the predominant vegetation is hardwood but farther east (between Denham Springs and Albany) there is a transition region; with longleaf pine prevailing from there to Covington.

It was suggested by Brown (1944) that this variation might be explained by the lack of homogeneity in geological formations. The soils in this area change from clay to a sandy soil. These differences within a terrace probably affect the expression of the vegetation types.

According to Brown (1945), "The longleaf pine flatwoods of Southwestern Louisiana differ from those of Eastern Louisiana, primarily by the absence of slash pine, and secondarily by the absence of several ericaceous shrubs. Numerous herbaceous plants are likewise absent from Southwestern Louisiana although they are present in Southeastern Louisiana."

Langdon et al (1952) considered the longleaf pine-bluestem range to be one of the most important range forage types in the south.

Recent studies revealed that grasses make up about 80 per cent of the range vegetation on longleaf pine-bluestem ranges and the average year-long diet of cattle on several Louisiana ranges was composed of 91 per cent grasses.

Lydia Bougere (1953) conducted a study in adjoining St. Tammany Parish in which she discussed the composition of certain plant communities and their relations with factors of their environment. Numerous species of grasses were listed within selected communities.

A study of the common plants of the longleaf pine-bluestem range was presented by Grelen and Duvall (1966) in which they described a number of grasses, grass-like plants, forbs, and shrubs.

These workers also pointed out the abundance of grasses in these areas, and their importance in the diet of cattle as well as providing excellent food and cover for wildlife. Their studies revealed that grasses comprise at least 90 per cent of the vegetation.

Climate

According to Local Climatological Data (1960) compiled at the U. S. Weather Bureau in Baton Rouge, the climate of Tangipahoa Parish is characterized by short mild winters and long warm summers. Freezing weather is infrequent during the winter, and snow and ice are seen only occasionally. Based on records of the past fifty-five winters, the maximum temperature averages 64.8°F and the minimum temperature averages 44.8°F. The winters are moist, due to long misty rains and slow evaporation.

Gulf breezes temper the summer heat, and the nights are pleasantly cool although the summer days may seem hot due to the high humidity. The summer season is comparatively dry; rains come in showers during this season, with dry periods in between. The maximum temperature averages 91.0°F during the summer with the minimum temperature averaging 71.6°F. The maximum temperature during the spring and fall months averages 78.9°F, with 57.9°F being the minimum for these periods. Precipitation is fairly well distributed throughout the year, with an average annual rainfall of about sixty inches; however, the fall months are relatively dry.

The local Climatological Sheets (1960) further showed that the average date of the last killing frost is March 9 and the first is November 13, giving an average frost-free period of 249 days duration.

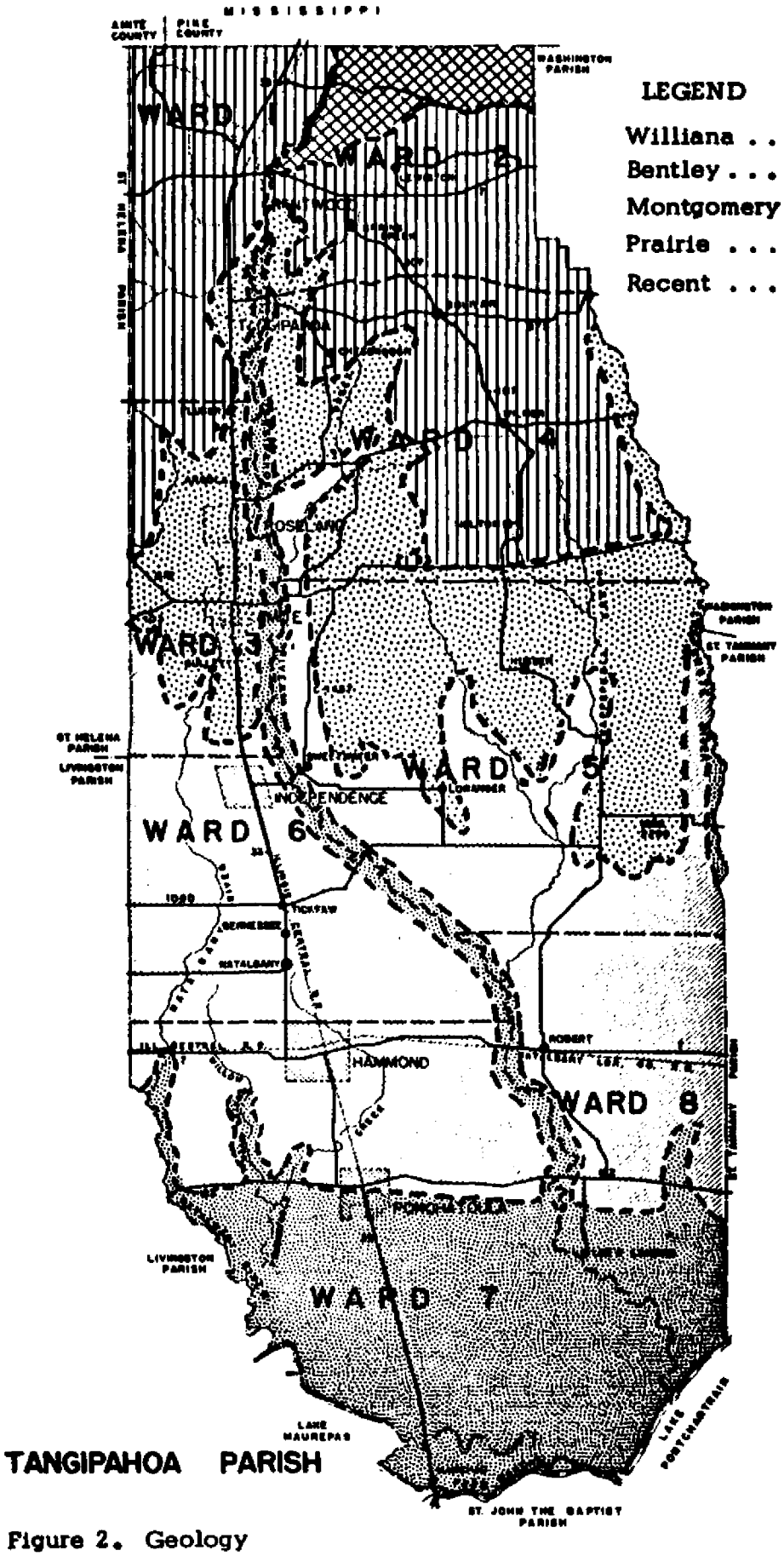


Figure 2. Geology

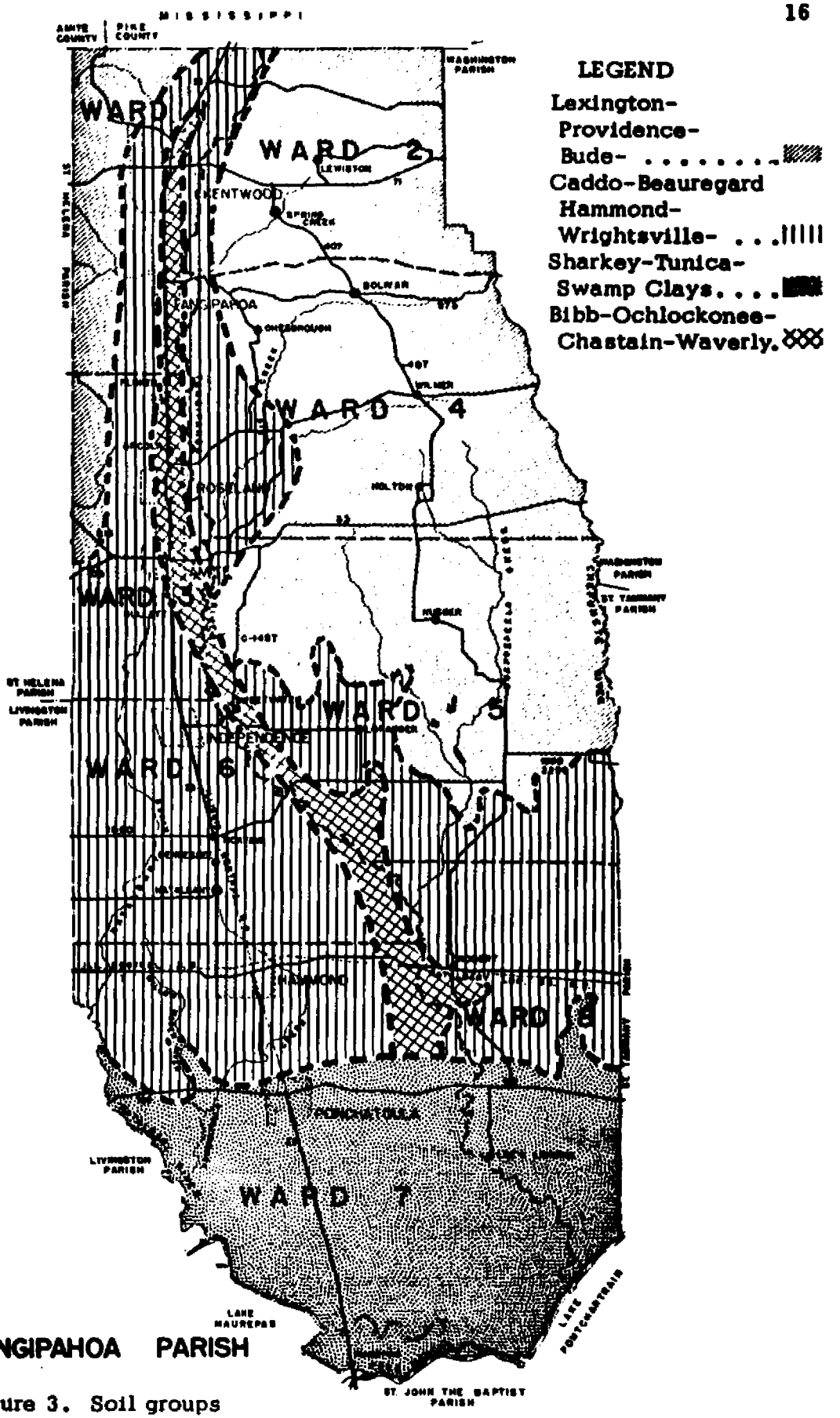


Figure 3. Soil groups

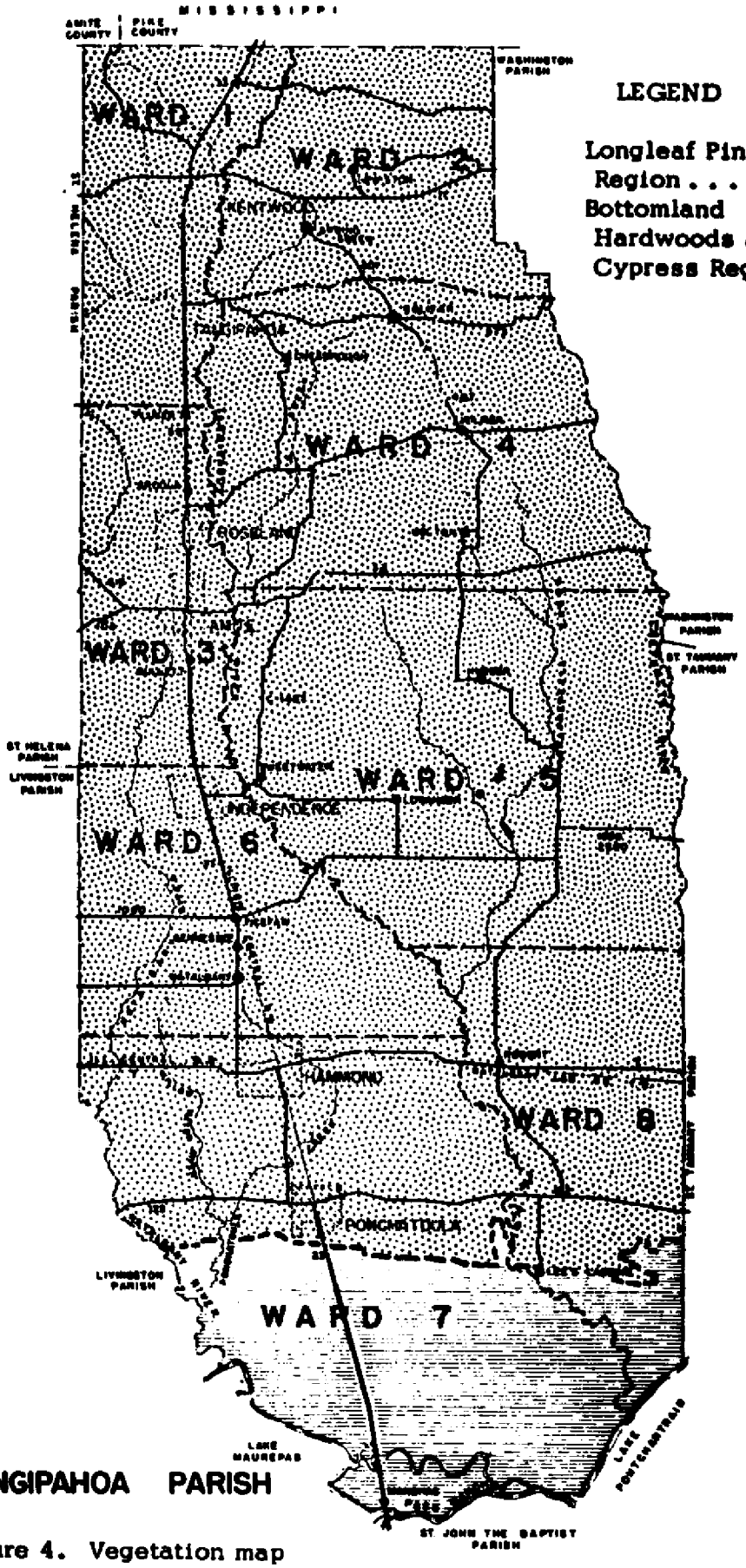


Figure 4. Vegetation map

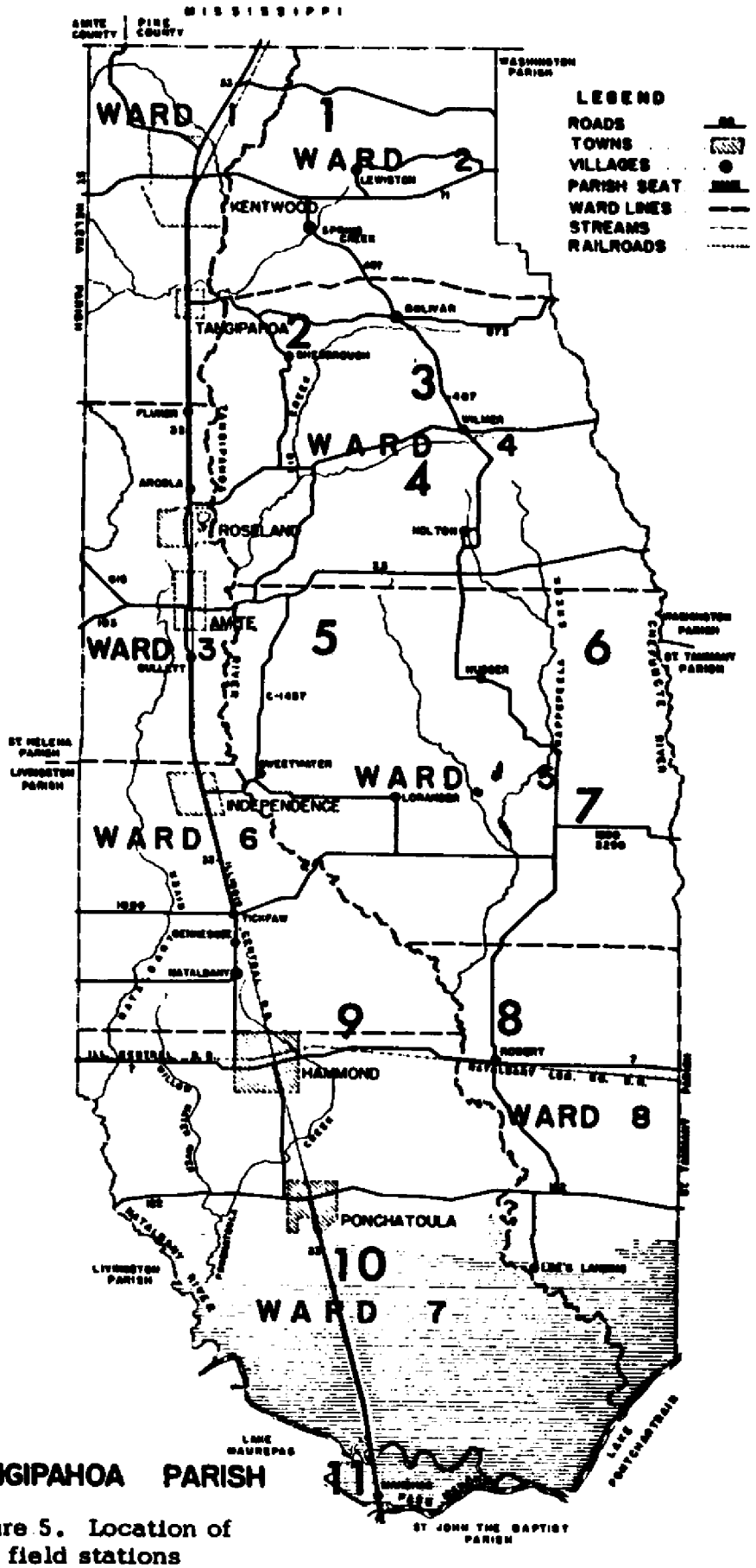


Figure 5. Location of field stations

SECTION PLAT SHEET

OWNER Station No. 1 DATE March 2, 1850

SECTION 21, 27, 28, 32, 33 34, 35 TOWNSHIP 1 S RANGE 8 E

COUNTY Tangipahoa STATE Louisiana, Greensburg District SCALE

		21	No corner or witness trees cited in this survey.		
		28	27		
	32	33	34	35	

	31					36	
1	6					1	6
36	31					36	31
	6					1	

Stock No. 45330 Forestry Suppliers Inc., Jackson, Miss.

Field notes of Silas Taylor

Book No. 1, Pages 10 & 11

State Land Office, Baton Rouge

"Poor pine land. Open poor pine land. Level poor pine land. Pine and oak. Good pine timber."

Figure 6

SECTION PLAT SHEET

OWNER Station No. 1 DATE March 2, 1850

SECTION 17, 18, 19, 20, 29, 30, 31 TOWNSHIP 1 S RANGE 8 E

COUNTY Tangipahoa STATE Louisiana, Greensburg District SCALE

18	17				
19	20				
30 Dogwood 4"	29				
31 Pine 20"					

	31					36	
1	6					1	6
36	31					36	31
	6					1	

Field notes of Silas Taylor

Book No. 1, Pages 12 & 13

State Land Office, Baton Rouge

"Rolling poor pine land. Pine growth. Growth pine and oak."

 Figure 7

SECTION PLAT SHEET

OWNER Stations No. 2, 3 & 4 DATE February 13, 1849

SECTION 11, 12, 13, 14, 23, 24, 25, 26 TOWNSHIP 2 S & 3 S RANGE 7 E

COUNTY Tangipahoa STATE Louisiana, Greensburg District SCALE

				11 Pine 18" Pine 15" Pine 18" Red Oak 12"	12
				14 Pine 12" Pine 12" Pine 26" Pine 30" Pine 24"	13
				23	24 Pine 18"
				26	25 Pine 15"

	31					36	
1	6					1	6
36	31					36	31
	6					1	

Stock No. 45230 Forestry Suppliers Inc., Jackson, Miss.

Field notes of C. J. Cabell
Book No. 2, Page 84
State Land Office, Baton Rouge
"Open rolling pine woods. Poor open pine land."

Figure 8

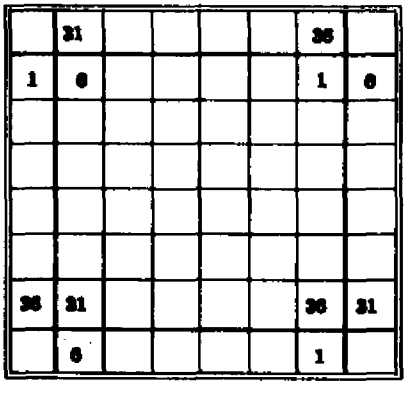
SECTION PLAT SHEET

OWNER Stations No. 5, 6 & 7 DATE January 29, 1848

SECTION 5, 6, 7, 8 TOWNSHIP 4 S RANGE 8 E

COUNTY Tangipahoa STATE Louisiana, Greensburg District SCALE

6 Pine 10" Pine 30" Pine 24" Black Jack 5" Post Oak 12"	5				
7 Pine 14" Pine 24" Hickory 8" Dogwood 8" White Oak 20"	8				



Stock No. 45330 Forestry Suppliers Inc., Jackson, Miss.

Field notes of I. C. Taylor
Book No. 3, Pages 12 & 13
State Land Office, Baton Rouge
"Ran South, I note pine land, low and level, I note pine land, I note rolling pine land. Low land, greatly undulating."

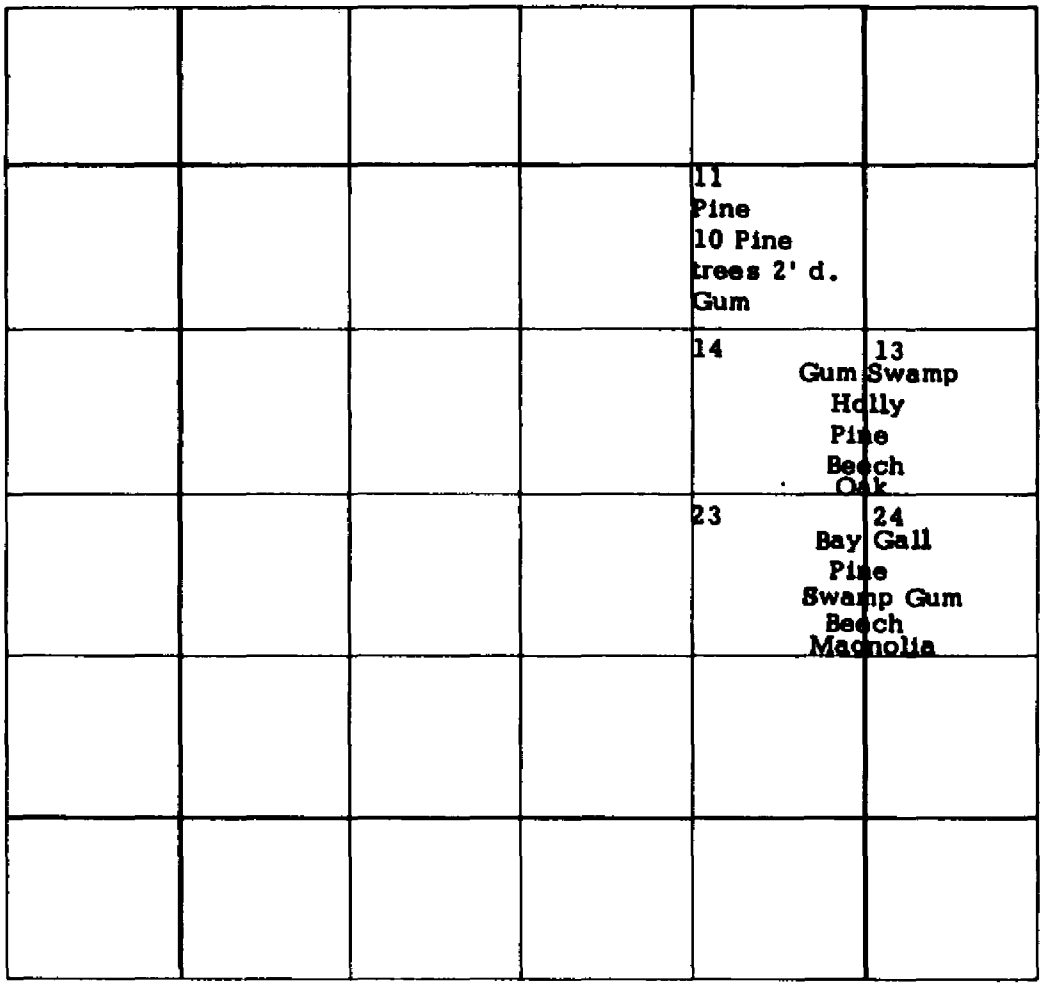
Figure 9

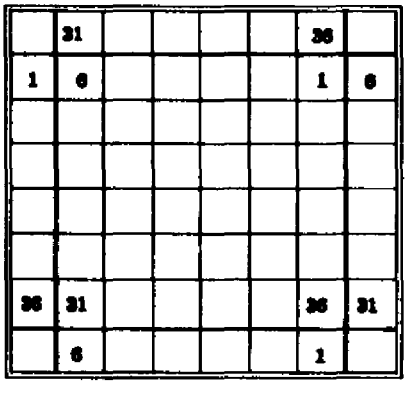
SECTION PLAT SHEET

OWNER Stations No. 8 & 9 DATE November 8, 1845

SECTION 11, 13, 14, 23, 24 TOWNSHIP 6 S RANGE 8 E

COUNTY Tangipahoa STATE Louisiana, Greensburg District SCALE





Field notes of Weightman & Taylor
Book No. 8A, Pages 254 & 255
State Land Office, Baton Rouge
"Tangipahoa swamp, some rich land. Note land has some good timber. I first note swamp. Second note pine land."

Stock No. 46250 Forestry Suppliers Inc., Jackson, Miss.

Figure 10

SECTION PLAT SHEET

OWNER Stations No. 10 & 11 DATE April 3, 1860

SECTION 6 & 5 mile Match Line TOWNSHIP 7 S, 8 S & 9 S RANGE 7 E

COUNTY Tangipahoa STATE Louisiana, Greesburg District SCALE

		33 Tupelo Gum 10" Cypress 30" Tupelo Gum 12" Tupelo Gum 12" Sweet Bay 14"	34	35 Red Oak 18" Water Oak 5" Water Oak 8" Cherry 4" Water Oak 8"	36

	31					36	
1	6					1	6
36	31					36	31
	6					1	

Stock No. 46330 Forestry Suppliers Inc., Jackson, Miss.

Field notes of Joseph Gorlinski

Book No. 11A, Pages 559 & 560

State Land Office, Baton Rouge

"Low flat land timbered with cypress and gum. Undergrowth, palmetto and thick bryers (briars)."

Figure 11

SECTION PLAT SHEET

OWNER Stations No. 10 & 11 DATE April 3, 1860

SECTION 4 & 3 mile Match Line TOWNSHIP 7 S, 8 S, & 9 S RANGE 8 E

COUNTY Tangipahoa STATE Louisiana, Greensburg District SCALE

31 Ash 15" Maple 12" Oak 8" Oak 5"	32	33	34	35 Maple 12" Pin Oak 8" Ash 6" Ash 9" Ash 9"	36

	31					36	
1	6					1	6
36	31					36	31
	6					1	

Stock No. 48330 Forestry Suppliers Inc., Jackson, Miss.

Field notes of Joseph Gorlinski

Book No. 11A, Page 560

State Land Office, Baton Rouge

"Low flat timbered land with oak, cypress and gum."

Figure 12

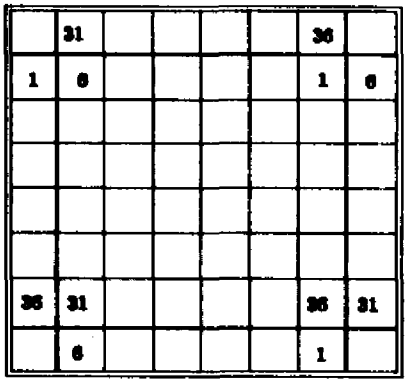
SECTION PLAT SHEET

OWNER Stations No. 10 & 11 DATE April 3, 1860

SECTION 2 & 1 mile Match Line TOWNSHIP 7 S, 8 S & 9 S RANGE 9 E

COUNTY Tangipahoa STATE Louisiana, Greensburg District SCALE

31 Maple 8" Maple 14" Cypress 36" Elm 24" Cypress 28"	32 Tupelo Gum 30" Maple 13" Oak 3" Elm 14" Live Oak 15"	33	34	35 Cypress 12" Ash 8" Tupelo Gum 18" Ash 6"	36 Sweet Bay 4" Ash 5" Cypress 3 ft.



Stock No. 46330 Forestry Suppliers Inc., Jackson, Miss.

Field notes of Joseph Gorlinski
Book No. 11A, Pages 560, 561 & 562
State Land Office, Baton Rouge

"All flat timbered land mostly with Tupelo Gum, Ash and Cypress. Subject to regular tidal overflow from Lake Pontchartrain. South side of North Pass Manchac. Low flat timbered land unfit for cultivation. Low swamp timbered land unfit for cultivation."

Figure 13

METHODS AND AREAS STUDIED

Tangipahoa Parish extends approximately 50 miles on a north-south line, being bounded on the north by the State of Mississippi and on the south by Lake Pontchartrain. This proved to be of great value in studying plant distribution as related to geology because the parish extends from the low, cypress-tupelogum swamp habitat on the south, to the rolling, hilly, longleaf pine habitat on the north. This made it possible to identify all four geological formations (Williana, Bentley, Montgomery, and Prairie) in addition to Recent surfaces within the parish. The general locations of the geological formations are indicated in Figure 2.

Geological formations were identified by field observations correlated with information and recent works supplied by the Geology Department, Louisiana State University.

Maps were made to show the general distribution of vegetation (Figure 4) as indicated in an earlier work by Brown (1945). It is important to note that this map represents the vegetation as it originally existed before disturbance by man.

General soils areas were also defined and their distribution illustrated (Figure 3) on the basis of information supplied by the Agronomy Department, Louisiana State University.

A general survey was made throughout the entire parish in an attempt to locate areas for intensive study. A total of 11 stations was selected for intensive study and these sites were selected on the basis of the following criteria: (1) that they lie within one of the specified geological formations; namely, Williana, Bentley, Montgomery, Prairie, or Recent, (2) that they be unfenced and out of cultivation for a long period of time, and (3) that they be at least 50 acres in size.

It should be noted here that these criteria were adhered to except on stations 10 and 11. These stations were selected for special reasons which will be revealed later in this work.

One study site was established on the Williana Formation because of scant extent in the parish, 3 on the Bentley, 3 on the Montgomery, 2 on the Prairie, and 2 on the Recent. The exact location of these study sites (Stations 1-11) is indicated in Figure 5.

Field collections, primarily of grasses, occurring on the study sites were made monthly during the period from June 1, 1966 to May 31, 1967. Specimens were collected in triplicate, pressed, dried and mounted on standard herbarium paper with appropriate identifying labels affixed. Voucher specimens were preserved in the herbaria of Louisiana State University, Baton Rouge, Louisiana, the U. S. National Herbarium, Washington, D. C. and Southeastern Louisiana College at Hammond, Louisiana.

In addition to intensive study of the selected sites, material was also collected from roadside shoulders, ditches, stream banks and even from cultivated fields in certain instances, and grouped under miscellaneous collections.

Observations were recorded as to the occurrence of specific plant communities and assemblages within the study sites and photographs were taken showing the vegetational features of each location.

Table 1 shows the species of grasses collected at each station within the various geological formations in order to correlate distribution as it relates to the geology of the parish.

There is included, an annotated catalog of plants collected which serves as a contribution toward a flora of Tangipahoa Parish as well as to reveal some of the ecological aspects of the area.

The scientific names of grasses listed are in accord where possible, with Hitchcock (1950). The names of species other than grasses were taken from Fernald (1950) and Small (1933).

The original vegetation has been cut and second growth timber is gradually reinvading these sites. The original land surveys by various surveyors were examined to ascertain the original vegetation. Timber as well as other pertinent field notes recorded by these early surveyors, was transferred to plat sheets (Figures 6-13) in order to compare the original vegetation with that which exists at present.

It should be noted that surveys reviewed by the author were intended to generally coincide, though not exactly in all cases, with the sites selected for study in this work.

A description of each area selected for intensive study follows.

Station No. 1

The topography of the land at this site was quite rolling. This is the only station located within the Williana Formation and it was approximately 50 acres in size. Most of the Williana Formation in Tangipahoa Parish has been cleared and planted to improved pasture for milk production. It had a southerly slope and was bounded on the west by a gravel road. A fenced field which was planted to pasture crops was located across the road from this site.

The soil in this area appeared rather sandy and ranged from pink to brick red, to rust brown in color. Roads which cut through this general area left exposed slopes bare of vegetation except for a few vines and briars.

The site was well drained due to the slope. Upper-story vegetation consisted predominantly of scattered shortleaf pines which ranged from 10 to 40 feet tall and from 4 to 12 inches dbh (diameter breast high). Blackjack oak was found in association with the pine to a limited extent, with still fewer specimens of loblolly pine and southern red oak observed.

The lesser vegetation consisted of swamp-privet, French mulberry, huckleberry, chinaberry, crab-apple, greenbrier, blackberry, winged

sumac, pokeweed, yankeeweed, butterfly pea, rabbit tobacco, aster, dandelion, horse-nettle, ragweed, wood-sorrel, pepperweed, St. Andrew's cross, black-eyed susan, wild petunia, yellow dock, yellow flax, partridge pea, and Japanese lespedeza.

Grasses observed were carpetgrass, bluestem, several species of panicum, and Johnson grass along the roadside and outer margins of the area.

Station No. 2

This site consisted of approximately 100 acres of cutover longleaf. It was located on the Bentley Formation with a well-drained, slightly rolling terrain.

The soil was light to dark gray in color and would be classed as a sandy-clay.

The entire area was quite open, probably due to periodic burning. Burning was evidenced by the presence of fire lanes, as well as by the smutty basal tufts of bunch grasses.

The most abundant trees on this site were longleaf pine which ranged to 30 feet high with the greater majority being young trees, from 2 to 8 feet high. There was a lesser number of blackjack oak and southern red oak which ranged from 20 to 40 feet high and 6 to 18 inches dbh.

The understory vegetation possessed very few shrubs, but numerous herbs and grasses. Some of the more important forbs were

black-eyed susan, aster, yellow bachelor's button, blackberry, yankee-weed, thistle, partridge pea, French mulberry, milkweed, selfheal, goat's-rue, and meadow-beauty. Slender bluestem was in great abundance and formed the most massive ground cover.

Station No. 3

This study site was located on the Bentley Formation, bounded on the south by a small stream and possessing a southerly slope. The area was well drained with a slightly rolling terrain.

The soil appeared to be a sandy-clay and varied from red to rust brown in color.

The area comprised approximately 50 acres and was under cultivation at one time as indicated by old broken down fencing and flattened rows.

There was an abundance of second growth loblolly pine present which ranged from young seedlings to a few trees which were about 25 feet tall. The young seedlings were quite thick. Upperstory vegetation also included sweetgum, Chinese tallow, black cherry, and persimmon.

Shrubs and herbs present were French mulberry, trifoliate-orange, rattan vine, wild grape vines, blackberry, rabbit tobacco, yellow dock, thistle, yankeeweed, black-eyed susan, aster, wild petunia, goat's-rue, false dandelion, bracted plantain, and horse nettle.

Some of the more common grasses present were carpet, Dallis, Vasey, smut, and several species of panicum.

Station No. 4

This area consisted of approximately 100 acres of fairly open land on the Bentley Formation. The land was well drained with a slight slope to the west.

The soil had a sandy texture and was light tan to dark tan to pink in color.

A few longleaf pine were present that ranged from 15 to 40 feet tall. This site was open to grazing at the time of this study and the area showed definite signs of overgrazing. The grasses which made up the ground cover such as carpet, bahia, Vasey, and Dallis were reduced in size and abundance, probably indicating a lack of fertility and overgrazing.

Most of the other vegetation present was either confined to clumps of briars around trees or to the bottom of the westerly slope. Other plants recorded from the site were Chinese tallow, trifoliate-orange, huckleberry, black-eyed susan, rabbit tobacco, ladies'-tresses, milkweed, wild petunia, violets, yankeeweed, thistle, aster, yellow flax, goat's-rue, evening primrose, and wild indigo.

Station No. 5

This collecting site was approximately 100 acres in size and was on the Montgomery Formation. The area was well drained with a level to slightly rolling topography.

The soil was a sandy-clay and varied from light gray to rust brown in color.

The most conspicuous vegetational feature of the site was the almost pure stand of second growth longleaf pine. The trees ranged from 30 to 75 feet high and 6 to 18 inches dbh. A minor associate was blackjack oak, but these oaks were few in number and small in size.

This tract of land is owned by Crown Zellerbach Corporation and it was obvious that selective forestry management had been practiced on the area. Pine timber was abundant, yet open enough to permit good grass growth, and the entire understory was exceptionally clean. Rank undergrowth was confined to a minimum, possibly due to periodic burning.

Much of the lesser vegetation was concentrated along disturbed fire lanes which had been plowed in the area. Other plants noted were persimmon, wax myrtle, blackberry, clammy weed, black-eyed susan, meadow-beauty, yankeeweed, aster, rabbit tobacco, verbena, colicroot, sensitive briar, evening primrose, St. Andrew's cross, milkweed, horse-nettle, wild petunia, and several sedges and rushes.

Station No. 6

Station No. 6 was located on the Montgomery Formation, on level to slightly rolling terrain. It consisted of approximately 100 acres, was well drained and had a slight easterly slope. This site was located adjacent to a large farm (approximately 1000 acres) which was formerly devoted to the production of tung trees. At present however, the owner is bulldozing the tung trees into windrows and converting the land to crops suitable for cattle production.

The soil ranged from light gray to rust brown in color and had a sandy texture.

The area was covered predominantly with a thick stand of longleaf pine which ranged from seedlings up to 40 feet high, and up to 16 inches dbh. There was some evidence of thinning the pine stand but the young trees were still quite thick, with considerable undergrowth in some areas. There was also evidence of previous burning with fire lanes existing around and through the area. This site was open to grazing by cattle.

A field survey of the study site revealed other plants such as shortleaf pine, sassafras, several species of oak, winged sumac, huckleberry, wax myrtle, partridge pea, rabbit tobacco, black-eyed susan, colicroot, aster, goat's-beard, bedstraw, meadow-beauty, thistle, greenbrier, phlox, wood-sorrel, and several sedges and rushes.

Station No. 7

This was a 50 acre study site situated on the Montgomery Formation. The land was level to slightly rolling and well drained.

The soil was sandy-clay and ranged from light gray to rust brown in color.

This site produced a heavy stand of loblolly pine with a lesser number of longleaf pine present. The trees ranged from saplings to 60 feet high. These trees were apparently the result of natural reseeding and evidently have never been thinned.

Fire scars on the trees as well as fire lanes indicated previous burning of the area. Old rows which were observed also indicated that the land was cultivated at some earlier time.

There was an extremely dense undergrowth of shrubs and briars. Plant species recorded from this site other than grasses were crab-apple, winged sumac, yaupon, huckleberry, French mulberry, rattan vine, greenbrier, blackberry, meadow-beauty, milkweed, yellow flax, black-eyed susan, violets, aster, rattlesnake-master, St. Andrew's cross, and a number of sedges and rushes.

Station No. 8

This study area was located on the Prairie Formation and comprised approximately 100 acres. The land was flat with slight scattered depressions and was poorly drained. In fact, during rainy weather the entire area remains rather wet and boggy.

The soil was a light gray clay and retained a high moisture content except during long dry periods.

The site was lumbered and remains extremely open at the present time, except for isolated clumps of shrubs and briars. It is grazed by range cattle. Fire lanes are present, indicating periodic burning.

The few trees present consisted mostly of loblolly and longleaf pine which ranged from 10 to 30 feet tall and 4 to 12 inches dbh. There was also a lesser number of blackjack oak on the site. The most abundant shrubs recorded were gallberry and wax myrtle.

One plant association of interest on this site was pitcher plant-sundew-club moss. Even though this association can be observed at other locations on the Prairie Formation, this is the only station of the eleven selected for intensive study, where this plant association occurred.

Other plants recorded from this site were willow oak, winged sumac, blackberry, black-eyed susan, wild petunia, rabbit tobacco, plantain, wild indigo, meadow-beauty, St. Andrew's cross, thistle, colicroot, and numerous sedges and rushes.

Station No. 9

This site was located on the Prairie Formation and consisted of approximately 150 acres. This area was used as an airbase by the U. S. Army Air Corps during World War II. It is presently known as Hammond Airport and is used for limited air service.

The land is flat and the acreage surrounding the runways is covered with a lush growth of grasses and low growing herbs. Numerous sedges and rushes are common in the low depressions and drainage ditches.

The extreme east side of the airport possessed a community of small slash pine, approximately 10 to 30 feet tall, which resulted from a very small number of parent trees which remained after clearing operations for the airbase.

Drainage is at a minimum on certain portions of the meadows and the soil was light gray to tan in color with a high clay content.

Florida paspalum, carpet, vasey, Dallis, and bahia grasses were predominant on the meadows. The wooded section revealed plants such as slash pine, elderberry, blackberry, yankeeweed, verbena, marsh mallow, bitterweed, buttonweed, horse-nettle, greenbrier, buttonbush, milkweed, goat's-rue, St. Andrew's cross, yellow bachelor's-button, titi, sundew, and club moss.

Station No. 10

This station consisted of fresh water marsh and a "spoil bank" approximately one mile long and 100 feet wide which resulted from dredging a drainage canal through the marsh in 1956. The marsh proper, covers approximately 80 square miles.

The general area would be classified as being of Recent origin by geologists. The water level in the canal and surrounding marsh is affected by tidal action of Lake Pontchartrain.

The surrounding marsh was composed primarily of paille fine, cattail, sagittaria, and pickerelweed. Several isolated clumps of roseau were also present in the marsh. Large areas of bald cypress and tupelogum surrounded the marsh.

The most abundant plants on the "spoil bank" were the vast entanglements of blackberry briars. Most of the grasses were confined to the areas near the bank of the canal where overflow is frequent. Willow was also abundant on the "spoil bank."

Other plants recorded from this area were alligator weed, fall panicum, marsh mallow, seashore-mallow, arrowhead, smartweed, fall seedbox, verbena, elderberry, buttonbush, goldenrod, sumpweed, bedstraw, Sacciolepis, feathergrass, wild gourd, lettuce, red maple, and a single loblolly pine which was approximately 10 feet tall.

Station No. 11

This study area ran parallel to and approximately 100 feet west of a recently constructed highway (I-55) through the marsh. The site was formerly an old canal which was back-filled and elevated to road level by dredging and pumping from a new canal to the west of this location, in the early 1950's. The material which was pumped and deposited as back-fill on this site is almost pure sand.

The general area falls within the Recent geological classification and drainage is at a minimum due to the surrounding marsh. It is

significant to note that much of this area was completely barren of vegetation, leaving nothing but an exposed, sandy surface.

A salinity test was run on soil samples taken from this site in order to give some indication as to the encroachment of salt water from Lake Pontchartrain. The pH of these samples was recorded as 3.4 with soluble salts of 0.568 per cent. A salinity reading of 0.5 to 2.0 per cent is generally classified as brackish.

The vegetation was confined to clumps or small "islands" scattered throughout the area, with the greatest concentrations being along the margin of the newly formed canal or on the roadside depressions. The most abundant grass present was large clumps of Vasey. A low growing sedge was fairly abundant and appeared to be a pioneer on the sandy soil.

The wetter margins revealed plants such as wax myrtle, willow, swamp bay, sweetgum, live oak, sea-myrtle, yankeeweed, paille fine, giant bristlegrass, bluestem, and Sacciolepis.

Miscellaneous Sites

In addition to the eleven established study sites, collections of plants were also made at random along streams and roadside ditches. These will be listed under "miscellaneous collections." It would be very difficult to accurately determine the geological classification of all these areas, but field observations indicate that these sites are for the most part, of Recent geological origin.

All the species of grasses collected during the course of this study are listed in Table 1, according to the geological formation on which they were found. The author does not intend to imply that the list is complete, but feels that sampling was adequate to represent the grass flora of Tangipahoa Parish.

In addition to the eleven stations which were selected for intensive study, collections were made at random throughout the parish, and these species are listed under Station No. 12, miscellaneous collections. The station designations 1-11 are based on geological formations within the parish. (No. 1 - W - Williana; Nos. 2, 3, 4 - B - Bentley; Nos. 5, 6, 7 - M - Montgomery; Nos. 8, 9 - P - Prairie; and Nos. 10, 11 - R - Recent).

Table 1. The following is a list of grasses for Tangipahoa Parish, Louisiana, found on different geological formations. (* denotes introduced species).

Species	Station No. W 1	B 2	B 3	B 4	M 5	M 6	M 7	P 8	P 9	R 10	R 11	Mi 12
Agrostis hiemalis	X	X	X	X	X	X	X	X	X			X
Agrostis perennans	X											
Alopecurus carolinianus												X
Amphibromus scabrivalvis*												X
Andropogon divergens		X			X	X	X					
Andropogon elliottii		X										
Andropogon gerardi					X	X	X					
Andropogon glomeratus						X			X		X	
Andropogon mohrii								X				
Andropogon scoparius	X		X	X	X	X		X	X			
Andropogon subtenuis		X			X							
Andropogon tener		X		X	X	X	X	X	X			
Andropogon ternarius				X		X						
Andropogon tracyi	X		X	X	X							
Andropogon virginicus	X		X				X	X	X			
Anthaenantia rufa						X	X	X	X			
Anthaenantia villosa		X			X	X	X					
Aristida dichotoma			X									
Aristida longespica		X		X		X			X			

Table 1. Continued

Species	Station No. W 1	B 2	B 3	B 4	M 5	M 6	M 7	P 8	P 9	R 10	R 11	Mi 12
Aristida oligantha				X				X				X
Aristida purpurascens				X		X						
Aristida virgata		X			X	X	X		X			
Arthraxon hispidus*												X
Arundinaria gigantea									X			X
Arundinaria tecta									X			X
Avena sativa*					X							X
Axonopus affinis	X	X	X	X	X	X	X	X	X			
Brachiaria platyphylla												X
Briza minor*												X
Bromus catharticus*												X
Ctenium aromaticum		X			X	X		X				
Cynodon dactylon*	X		X	X	X	X			X		X	X
Digitaria filiformis		X	X		X	X						
Ditigaria ischaemum*			X				X					
Digitaria sanguinalis*	X				X				X			X
Digitaria violascens*	X											
Echinochloa colonum*					X				X			
Echinochloa crusgalli*	X									X	X	
Echinochloa walteri forma laevigata										X		

Table 1. Continued.

Species	Station No. W 1	B 2	B 3	B 4	M 5	M 6	M 7	P 8	P 9	R 10	R 11	Mi 12
Eleusine indica*												X
Eragrostis capillaris	X											
Eragrostis elliottii								X	X			
Eragrostis lugens*		X										
Eragrostis refracta		X			X	X						
Eragrostis spectabilis	X	X			X	X	X		X			
Erianthus giganteus									X	X		X
Erianthus strictus									X	X		X
Festuca octoflora		X	X			X						
Festuca versuta	X											
Gymnopogon ambiguus	X	X		X			X					
Gymnopogon brevifolius						X		X				
Hordeum pusillum*												X
Leersia hexandra												X
Leersia oryzoides												X
Lolium multiflorum*	X			X	X				X			X
Lolium perenne*	X								X			X
Manisuris tessellata								X				
Melica mutica												X
Muhlenbergia expansa		X		X	X			X				

Table 1. Continued.

Species	Station No. W 1	B 2	B 3	B 4	M 5	M 6	M 7	P 8	P 9	R 10	R 11	Mi 12
Muhlenbergia schreberi												X
Panicum aciculare		X	X	X		X						
Panicum anceps					X	X						
Panicum angustifolium	X	X			X	X	X					
Panicum arenicoloides						X						
Panicum commutatum	X				X							X
Panicum dichotomiflorum										X	X	X
Panicum gymnocarpon										X	X	X
Panicum hemitomon										X		X
Panicum hians								X	X			
Panicum lindheimeri	X	X	X	X	X	X	X	X	X			
Panicum microcarpon		X	X		X	X	X	X	X			
Panicum polyanthes					X	X						
Panicum rhizomatum	X	X	X	X	X	X	X	X	X	X	X	X
Panicum scoparium			X	X		X			X			X
Panicum sphaerocarpon				X		X	X					
Panicum stipitatum								X	X			
Panicum verrucosum									X		X	
Panicum virgatum					X		X	X	X			
Panicum xalapense		X										X

Table 1. Continued.

Species	Station No. W 1	B 2	B 3	B 4	M 5	M 6	M 7	P 8	P 9	R 10	R 11	Mi 12
Paspalum boscianum*								X	X			
Paspalum ciliatifolium			X									
Paspalum circulare					X	X	X	X	X			
Paspalum dilitatum*	X	X	X	X	X	X	X	X	X	X	X	X
Paspalum distichum											X	
Paspalum floridanum	X	X	X	X	X	X	X	X	X			
Paspalum floridanum var. glabratum								X	X			
Paspalum laeve		X	X									
Paspalum longipilum							X					
Paspalum minus*				X	X							
Paspalum notatum*	X	X	X	X	X	X	X	X	X			X
Paspalum notatum var. saurae*									X			X
Paspalum plicatulum		X	X	X	X		X					
Paspalum praecox								X				
Paspalum pubescens	X	X	X	X	X	X	X					
Paspalum stramineum		X	X	X	X	X	X					
Paspalum urvillei*	X	X	X	X	X	X	X	X	X			X
Phalaris angusta									X	X		X
Phalaris caroliniana	X											X

Table 1. Continued.

Species	Station No. W 1	B 2	B 3	B 4	M 5	M 6	M 7	P 8	P 9	R 10	R 11	Mi 12
Phragmites communis										X	X	X
Poa annua*					X							X
Poa autumnalis												X
Sacciolepis striata										X	X	X
Setaria geniculata	X	X			X	X		X	X			
Setaria magna											X	X
Sorghastrum elliottii	X											
Sorghastrum nutans					X	X	X	X				
Sorghum halepense*	X	X	X	X	X	X	X	X	X	X	X	X
Sphenopholis filiformis		X	X	X	X	X	X					
Sphenopholis obtusata								X	X			X
Sporobolus junceus		X		X	X	X	X					
Sporobolus macer	X	X	X	X								
Sporobolus poiretii*	X	X	X	X								X
Tridens ambiguus				X	X	X		X	X			
Tridens flavus	X											X
Tridens strictus												X
Tripsacum dactyloides												X
Uniola laxa	X					X	X					X
Zizaniopsis miliacea										X	X	X

ANNOTATED CATALOG

During the course of this study, greatest emphasis was placed upon the grasses. Notes were recorded of plants other than grasses however, for purposes of describing the vegetation of the region. Voucher specimens of grasses were preserved. Voucher specimens of plants other than grasses were not preserved in all cases. Many of these species were listed from field observations.

The author does not intend that the annotated catalog be considered complete for Tangipahoa Parish. He does feel however, that sampling was adequate to describe the vegetation of the region as a whole.

The following is an annotated catalog of all species collected and/or observed for Tangipahoa Parish, Louisiana.

Acer drummondii Hooker & Arnold — Swamp red maple

This tree is widely scattered throughout the parish along streams and in low woods.

Agave virginica L. — False aloe

Prairie Formation; cutover pineland on moist sites; frequent; flowering June to August.

Agrostis hiemalis (Walt.) B.S.P. — Spring creep grass

Williana, Bentley, Montgomery, Prairie and Recent Formations; open fields, roadsides and waste places; very abundant in spring; flowering April to June.

Agrostis perennans (Walt.) Tuckerm. Autumn bent grass

Williana Formation; open ground and open woods on well-drained sites; frequent; flowering September into November.

Aletris aurea Walt. Golden colicroot

Montgomery and Prairie Formations; open pine woods and cutover pineland on moist sites; locally abundant; flowering June and July.

Aleurites fordii Hemsl. Tung-oil tree

Montgomery and Prairie Formations; locally abundant; escaped from cultivation; flowering March and early April. Extensive plantations of this tree were formerly grown in Tangipahoa, as well as in neighboring parishes to the east. However, due to the laborious task of harvesting the nuts and the scarcity of labor, this industry is rapidly disappearing. In fact, during the course of this work, I observed several hundreds of acres which were being uprooted by bulldozers to make the land more suitable for other farming practices.

Alopecurus carolinianus Walt. Piney woods foxtail

Growing on cultivated pastures, old fields and wet sites; occasional generally but abundant on recently cultivated soils; flowering March to June.

Alternanthera philoxeroides Griseb. Alligator weed

Recent Formation; swamps, marsh, streams and ditches; very abundant locally; oftentimes a serious pest due to clogging streams and drainage ditches; flowering March to November.

Ambrosia bidentata Michx. Common ragweed

Williana, Bentley, Montgomery, Prairie and Recent Formations; open fields, woods margins, roadsides and waste places; locally abundant; flowering August to October.

Ambrosia trifida L. Great ragweed

Growing in rich soil along roadsides, streambanks and waste places; locally abundant; flowering late June to September.

Amphibromus scabrivalvis (Trin.) Swallen Buffo grass

Growing as an obnoxious weed in strawberry fields; very abundant locally; flowering April into June. This grass has been reported from several strawberry fields in one localized area of the state. Flinchum (1966) reported that this plant was first discovered in the state in 1950. At this time, Dr. Clair A. Brown, Louisiana State University was contacted to help with identification. He sent specimens to the U. S. National Herbarium and positive identification was provided by Swallen. The first discovery of this plant within the state was in a strawberry field two miles north of Independence, Louisiana. Amphibromus is of South American origin. Swallen (1931) placed this plant in the tribe Festuceae because the glumes are much shorter than the spikelet. Black (1943) placed it in the tribe Aveneae because of the twisted awn which rises from between two teeth or lobes at the summit of the lemma. It appears that this grass could possibly become a

serious weed problem. This plant produces both aerial spikelets and subterranean spikelets. In addition, it also reproduces vegetatively by means of small corm-like structures. The owner of the farm where this grass was collected related that the plant responds very favorably to cultivation practices such as fertilization and soil tillage. It does not invade uncultivated headlands and turnrows. This indicates that possibly it cannot withstand competition and compacted soil. When the strawberry fields are plowed up in June, the corm-like structures are extremely abundant. Amphibromus begins to sprout again in late fall and winter while a cover crop is growing on the land.

Andropogon divergens (Hack.) Anderss. ex Hitch. Pinehill bluestem

Bentley and Montgomery Formations; open woods, open fields and roadsides on well-drained sites; quite abundant; flowering September into November.

Andropogon elliottii Chapm. Elliott beardgrass

Bentley Formation; cutover woods, open fields and roadsides; well-drained sites; occasional; flowering September into November.

Andropogon gerardi Vitman. Big bluestem

Montgomery Formation; open woods and roadsides; well-drained sites; scattered clumps; flowering September into November.

Andropogon glomeratus (Walt.) B.S.P. Bushy beardgrass

Montgomery, Prairie and Recent Formations; ditchbanks, marshes and swamps; fairly abundant; flowering September into November.

Andropogon mohrii (Hack.) Hack. ex Vasey Mohrs beardgrass

Prairie Formation; ditchbanks and depressions; occasional; flowering September into November.

Andropogon scoparius Michx. Little bluestem

Williana, Bentley, Montgomery and Prairie Formations; old fields, open woods and roadsides; occasional throughout; flowering September into November.

Andropogon subtenuis Nash. Fineleaf bluestem

Bentley and Montgomery Formations; open woods and cutover pineland; well-drained slopes and knolls; occasional; flowering September into November.

Andropogon tener (Nees.) Kunth. Slender bluestem

Bentley, Montgomery and Prairie Formations; open woods, cutover pineland and roadsides; very abundant; flowering July into September.

Andropogon ternarius Michx. Paintbrush bluestem

Bentley and Montgomery Formations; open woods and cutover pineland; abundant; flowering September into November.

Andropogon tracyi Nash. Tracys beardgrass

Williana, Bentley and Montgomery Formations; open pine woods; abundant; flowering September into November.

Andropogon virginicus L. Broomsedge

Bentley, Montgomery and Prairie Formations; old fields, cutover pineland and roadsides; abundant; flowering September into November.

Anthaenantia rufa (Ell.) Schult. Purple silkyscale

Montgomery and Prairie Formations; open woods and cutover pineland; scattered throughout; flowering July into November.

Anthaenantia villosa (Michx.) Beauv. Green silkyscale

Bentley and Montgomery Formations; open woods and cutover pineland; scattered throughout; flowering July into November.

Aristida dichotoma Michx.

Bentley Formation; open woods and old fields; occasional throughout and in dense patches; flowering September into November.

Aristida longespica Poir.

Bentley, Montgomery and Prairie Formations; open pine woods, old fields and dry roadsides; fairly abundant; flowering September into November.

Aristida oligantha Michx. Prairie three-awn

Bentley and Prairie Formations; open pine woods and dry roadsides; fairly abundant; flowering September into November.

Aristida purpurascens Poir. Arrowfeather

Bentley and Montgomery Formations; open pine woods and dry roadsides; fairly abundant; flowering September into November.

Aristida virgata Trin. Bristly three-awn

Bentley, Montgomery and Prairie Formations; open pine woods, old fields and roadsides; abundant; flowering September into November.

Aronia arbutifolia (L.) Ell. Red choke-berry

Prairie Formation; low pineland; occasional; flowering March and early April.

Arthraxon hispidus (Thunb.) Makino. Spear point arthraxon

Growing along roadside south of Hammond, Louisiana; rare; flowering September into November. This grass is an introduction from the Orient and has been reported only twice before, in the state. This is the first collection from Tangipahoa Parish.

Arundinaria gigantea (Walt.) Muhl. Giant cane

Moist ground, stream banks and low woods throughout the parish; fairly abundant; flowering March into April. In former years it has been somewhat of a problem to distinguish between A. gigantea and A. tecta due to the scarcity of flowering material for study. The literature reveals varied accounts as to frequency of flowering. Brown (1929) reported evidence for claiming that the different forms of Arundinaria which had previously been

considered as two distinct species were in reality but one. West (1934) confirmed Brown's earlier claim when he found flowering culms which fit the descriptions of both A. gigantea and A. tecta growing from the same rhizome. He grew the two canes side by side and after a lapse of two years, they could not be distinguished. West (1934) concluded that the two forms constituted a single species and that it was impossible to thoroughly separate the canes into different species by the characterstics listed in the manuals. In the course of this work, I also found evidence which lends support to the contention made by Brown (1929) and West (1934). See Figures 37 and 38. McClure (1963) reported results of exploratory field and herbarium studies which indicated that the presence or absence of air canals in the rhizomes could be used with confidence to differentiate plants typical of A. gigantea from A. tecta, even in the sterile condition. It is on the basis of McClure's work that I call these specimens A. gigantea, due to the absence of air canals in the rhizomes.

Arundinaria tecta (Walt.) Muhl. Switch cane

Moist ground, stream banks and low woods throughout the parish; fairly abundant. This plant was collected in the sterile condition. Even though many communities of cane were investigated throughout the course of this study, I was unable to collect

flowering material of this species. However, I identified this material on the basis of McClure's (1963) work, due to the presence of air canals in the rhizomes.

Asclepiodora viridis (Walt.) Gray — Milkweed

Williana, Bentley, Montgomery and Prairie Formations; open pine woods, open fields and roadsides; occasional throughout; flowering May to July.

Ascyrum stans Michx. — St. Peter's-wort

Williana, Bentley, Montgomery and Prairie Formations; open woods, old fields and roadsides; fairly abundant; flowering July to September.

Avena sativa L. — Oat

Williana, Bentley, Montgomery and Prairie Formations; commonly cultivated and occasionally escaped along roadsides; flowering April to June.

Axonopus affinis Chase — Common carpetgrass

Williana, Bentley, Montgomery and Prairie Formations; open woods, old fields, roadsides and waste places; abundant, especially on moist, intensely grazed sites; flowering April into November.

Baccharis halimifolia L. — Eastern baccharis

Prairie and Recent Formations; swamp margins, shallow ditches and roadsides; fairly abundant; flowering August to October.

Baptisia leucophaea Nutt. Wild indigo

Bentley and Prairie Formations; open pine woods, old fields and roadsides; fairly abundant; flowering March and early April.

Berchemia scandens (Hill) Trelease. Rattan vine

This woody vine is found scattered throughout the parish, especially along streams and in thickets; flowering April and May.

Brachiaria platyphylla (Griseb.) Nash Creeping brachiaria

Growing on low, disturbed sandy ground; common; flowering September into November.

Briza minor L. Little quaking grass

Growing along disturbed roadsides and railroad embankments; occasional, spreading in recent years; flowering April to June.

Bromus catharticus Vahl. Rescue grass

Growing in cultivated pastures, disturbed roadsides and open waste places; occasional; flowering April to June.

Callicarpa americana L. French mulberry

Williana, Bentley, Montgomery, Prairie and Recent Formations; open rich woods, along streams and thickets and old fence rows; occasional throughout; flowering April to June; fruiting August to November.

Callirhoe papaver (Cav.) Gray — Poppy-mallow

Bentley Formation; open pine woods and woods margins in dry sandy soil; occasional; flowering June and July.

Carex flaccosperma Dew. — Flaccid-fruited sedge

Bentley and Montgomery Formations; open pine woods and old fields on moist sites; occasional; flowering April to June.

Carya spp. — Hickory

Several species of hickory are found scattered along the streams throughout the parish. They are most abundant on the Prairie Formation where the hardwoods predominate.

Cephalanthus occidentalis L. — Buttonbush

Prairie and Recent Formations; swamps, stream margins, ditches and pond margins; locally abundant; the main bloom period is May to June.

Chondrophora nudata (Michx.) Britton — Rayless-goldenrod

Prairie Formation; open pine woods and wet open fields; occasional; flowering July to October.

Cirsium horridulum forma Elliottii (T. & G.) Fern. — Common thistle

Williana, Bentley, Montgomery, Prairie and Recent Formations; open fields, roadsides and waste places; occasional throughout; flowering March into June.

Citrus trifoliata L. Trifoliate-orange

This small tree is found scattered throughout the parish, especially at old home sites and along fence rows, as an escape from cultivation.

Clitoria mariana L. Butterfly-pea

Williana, Bentley and Montgomery Formations; open pine woods and stream banks; occasional; flowering June to August.

Crotonopsis elliptica Willd. Elliptical rushfoil

Montgomery Formation; open pine woods on dry sandy soil; occasional; flowering July to September.

Ctenium aromaticum (Walt.) Wood. Toothache grass

Bentley, Montgomery and Prairie Formations; cutover pineland and open longleaf stands; fairly abundant; flowering June into August.

Cuphea petiolata (L.) Koehne Clammy waxweed

Williana, Bentley, Montgomery, Prairie and Recent Formations; woods margins, old fields and roadsides; fairly abundant; flowering July to October.

Cynodon dactylon (L.) Pers. Bermuda grass

Williana, Bentley, Montgomery, Prairie and Recent Formations; open ground, fields, roadsides and waste places; abundant; flowering April into November.

Cyperus strigosus L. Sandy sedge

Recent Formation; swamps, old fields and waste places; locally abundant; flowering August to October. This plant was growing in almost pure sand on Station No. 11. It was very abundant and appeared to be a pioneer species on the barren sand.

Cyrilla racemiflora L. Titi

Prairie Formation; swamps and along streams in pine woods; occasional; flowering in June.

Dichromena colorata (L.) Hitchc. Star-rush

Prairie Formation; wet places and low grounds; occasional; flowering July to September.

Digitaria filiformis (L.) Koel.

Bentley and Montgomery Formations; open fields, wood margins and roadsides; occasional; flowering April into November.

Digitaria ischaemum (Schreb.) Schreb. ex Muhl. Smooth crabgrass

Bentley and Montgomery Formations; open pine woods, waste places and roadsides; occasional; flowering June to September.

Digitaria sanguinalis (L.) Scop. Crabgrass

Williana, Bentley, Montgomery, Prairie and Recent Formations; old fields, woods margins, roadsides and waste places; abundant, very common in cultivated fields; flowering June to September.

Digitaria violascens Link.

Williana Formation; open pine woods in sandy soil; occasional; flowering July into November.

Diodia virginiana L. Buttonweed

Prairie and Recent Formations; low ground, ditches and depressions; locally abundant; flowering June to September.

Diospyros virginiana L. Persimmon

This tree is commonly scattered throughout the parish in open woods and old field sites.

Drosera brevifolia Pursh. Dwarf-sundew

Bentley and Prairie Formations; damp pineland, ditches and low, open fields; locally abundant; flowering March and April.

Echinochloa colonum (L.) Link Jungle-rice

Montgomery and Prairie Formations; ditches and moist depressions; occasional; flowering June into November.

Echinochloa crusgalli (L.) Beauv. Barnyard grass

Williana and Recent Formations; cultivated fields, ditches and waste ground; common; flowering June into November.

Echinochloa walteri forma laevigata Wiegand.

Recent Formation; wet places, often in shallow water or brackish marches; occasional; flowering June to September.

Eleusine indica (L.) Gaertn. Goosegrass

Disturbed ground, waste places and open ground; occasional; flowering July into November.

Eragrostis capillaris (L.) Nees — Lacegrass

Williana Formation; dry, open pine woods, sandy soil; occasional; flowering September into November. This specimen is atypical in that it produces few-flowered spikelets and sheds the caryopsis similar to Sporobolus. Critical identification was supplied by Dr. Thomas R. Soderstrom, U. S. National Herbarium, Washington, D. C.

Eragrostis elliottii S. Wats. — Elliott lovegrass

Prairie Formation; low ground, roadsides and moist pine woods; fairly abundant; flowering September into November.

Eragrostis lugens Nees. — Lovegrass

Bentley Formation; open woods and dry roadsides; occasional; flowering September into November.

Eragrostis refracta (Muhl.) Scribn. — Coastal lovegrass

Bentley and Montgomery Formations; open woods and cutover pineland; occasional; flowering September into November.

Eragrostis spectabilis (Pursh.) Steud. — Purple lovegrass

Williana, Bentley, Montgomery and Prairie Formations; open woods, old fields, roadsides and cutover pineland; fairly abundant; flowering September into November.

Erianthus giganteus (Walt.) Muhl. — Sugarcane plumegrass

Prairie and Recent Formations; ditches and low depressions; abundant on selected sites, scattered throughout; flowering September into November.

Erianthus strictus Baldw. Narrow plumegrass

Marsh and wet ditches parishwide; occasional; flowering September into November.

Eriocaulon decangulare L. Button-rod

Prairie Formation; cutover pineland and wet open fields; frequent in pine flatwoods; flowering May to July.

Eryngium yuccifolium Michx. Rattlesnake-master

Montgomery and Prairie Formations; open pine woods and old fields; abundant locally; flowering July and August.

Eupatorium capillifolium (Lam.) Small Yankeeweed

Williana, Bentley, Montgomery, Prairie and Recent Formations; borders of woods, old fields and roadsides; abundant; flowering September and October.

Eupatorium coelestinum L. Mistflower

Montgomery and Prairie Formations; low, open pine woods and borders of streams; common; flowering July to October.

Fagus grandifolia var. caroliniana Fern. & Rehd. Beech

Widely distributed but confined to stream bottoms throughout the parish.

Festuca octoflora Walt. Six-weeks fescue

Bentley and Montgomery Formations; open ground, old fields and roadsides; occasional; flowering April to June.

Festuca versuta Beal.

Williana Formation; open pine woods growing in shady, well-drained sites; occasional; flowering June to September.

Forestiera acuminata (Michx.) Poir. Swamp-privet

This shrub is confined to stream banks and old ponds; flowering March to April.

Fuirena squarrosa Michx. Umbrella-grass

Prairie Formation; wet, sandy ground in open pine woods and ditch banks; fairly abundant; flowering July to October.

Galium aparine L. Bedstraw

Montgomery, Prairie and Recent Formations; woods margins, old fields, roadsides and waste places; fairly abundant; flowering May to July.

Gaylussacia dumosa (Andr.) T. & G. Dwarf huckleberry

Montgomery and Prairie Formations; open pine woods and old fields on dry sites; fairly abundant; flowering May to June.

Gerardia fasciculata Ell. Purple gerardia

Montgomery and Prairie Formations; open pine woods and open fields; occasional; flowering August to September.

Gerardia pectinata (Nutt.) Benth. False foxglove

Williana and Bentley Formations; open pine woods in rolling hills; occasional; flowering July to September.

Festuca versuta Beal.

Williana Formation; open pine woods growing in shady, well-drained sites; occasional; flowering June to September.

Forestiera acuminata (Michx.) Poir. Swamp-privet

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Montgomery, Prairie and Recent Formations; woods margins, old fields, roadsides and waste places; fairly abundant; flowering May to July.

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Gerardia fasciculata Ell. Purple gerardia

Montgomery and Prairie Formations; open pine woods and open fields; occasional; flowering August to September.

Gerardia pectinata (Nutt.) Benth. False foxglove

Williana and Bentley Formations; open pine woods in rolling hills; occasional; flowering July to September.

Gnaphalium purpureum L. Rabbit tobacco

Williana, Bentley, Montgomery and Prairie Formations; borders of woods, old fields and roadsides; fairly abundant; flowering April and May.

Gymnopogon ambiguus (Michx.) B.S.P. Bearded skeletongrass

Williana, Bentley and Montgomery Formations; open pineland in partial shade; rare; flowering September into November.

Gymnopogon brevifolius Trin. Slim skeletongrass

Montgomery and Prairie Formations; open pineland, often in association with bearded skeletongrass, but usually occupies wetter sites; rare; flowering September into November.

Habenaria nivea (Nutt.) Spreng. White rein-orchid

Bentley, Montgomery and Prarie Formations; open pine woods on moist sites and wet open fields; common; flowering July to September.

Helenium tenuifolium Nutt. Bitterweed

Montgomery and Prairie For mations; open fields, woods margins, roadsides and waste places; very abundant locally; flowering June to November.

Helianthemum carolinianum (Walt.) Michx. Sun-rose

Williana, Bentley, Montgomery and Prairie Formations; open pine woods in dry, sandy soil; occasional; readily sheds petals when picked; flowering March and early April.

Helianthus angustifolius L. Narrow-leaved sunflower

Prairie Formation; open pine woods and wet open fields; common; flowering August to October.

Hibiscus lasiocarpos Cav. Marsh-mallow

Prairie and Recent Formations; swamps, paille fine marsh, roadside ditches and depressions; common; flowering July to September.

Hordeum pusillum Nutt. Little barley

Growing in cultivated pastures, open fields and disturbed roadsides; very abundant on selected sites; flowering April to June.

Hypoxis hirsuta (L.) Coville Yellow stargrass

Bentley Formation; open pine woods, old fields and roadsides; occasional; flowering April to September.

Ilex glabra (L.) Gray Gallberry

This shrub is found scattered throughout the pinelands but appears to be most abundant on the Prairie Formation.

Ilex vomitoria Ait. Yaupon

This shrub is scattered throughout the parish, especially along stream banks, woods margins and fence rows; flowers in early spring.

Illicium floridanum Ellis. Starbush

Prairie and Recent Formations; along stream bottoms and wet woods; common; flowering April to May.

Iva ciliata Willd. Marsh-elder

Recent Formation; swamp margins, shallow ditches and roadsides; locally abundant; flowering July to October.

Iva frutescens L. Marsh-elder

Recent Formation; swamp margins, shallow ditches and roadsides; locally abundant; flowering July to October.

Iva frutescens L. Marsh-elder

Recent Formation; swamp margins, shallow ditches and roadsides; locally abundant; flowering August to October.

Kosteletzkya virginica (L.) Presl. Seashore-mallow

Recent formation; swamps and paille fine marsh; occasional; flowering July to September.

Leersia hexandra Swartz.

Growing in roadside ditch, in standing water at Robert, Louisiana; rare; flowering June to August.

Leersia oryzoides (L.) Swartz. Rice cutgrass

Growing in roadside ditches in two locations within Tangipahoa Parish; one on the westernmost side and one in the central portion of the parish; rare; flowering September into November.

Lepidium virginicum L. Pepper grass

Williana, Bentley, Montgomery, Prairie and Recent Formations; old fields, woods margins and roadsides; common; flowering April to October.

Lespedeza striata (Thunb.) H. & A. Japanese clover

Williana, Bentley, Montgomery and Prairie Formations; old fields, woods margins and roadsides; escaped from cultivation; common; flowering July to October.

Liatris scariosa (L.) Willd. Scarious gayfeather

Bentley and Montgomery Formations; open pine woods on sandy soil; occasional; flowering July to September.

Liatris squarrosa (L.) Michx. Button-snakeroot

Montgomery and Prairie Formations; open pine woods and open fields; common; flowering July to September.

Linum floridanum (Planch.) Trel. Florida flax

Williana, Bentley, Montgomery and Prairie Formations; open pine woods on moist sites and old fields; occasional, but scattered throughout; flowering July to September.

Liquidambar styraciflua L. Sweetgum

This is a common tree found scattered throughout the parish, especially along streams and low woods.

Lobelia puberula Michx.

Montgomery and Prairie Formations; wet pine woods, moist open fields and thickets; occasional; flowering July to October.

Lolium multiflorum Lam. Italian ryegrass

Williana, Bentley, Montgomery and Prairie Formations; commonly cultivated and frequently escaped along roadsides; flowering April to June.

Lolium perenne L. Perennial ryegrass

Williana and Prairie Formations; open fields, roadsides and waste places; occasional; flowering April into June.

Ludwigia hirtella Raf. Hairy loosestrife

Prairie and Recent Formations; open pine woods on moist sites and wet open fields; occasional; flowering July to September.

Ludwigia sp. Fall seedbox

Recent Formation; swamps, paille fine marsh and shallow ditches; locally abundant; flowering July to October.

Lycopodium alopecuroides var. pinnatum (Chapm.) Lloyd & Underw. Foxtail clubmoss

Prairie Formation; this plant was a common associate with sundew and pitcher plant on Station No. 8 where the soil was quite moist and open.

Magnolia grandiflora L. Southern magnolia

This tree is abundant throughout the parish along streams and is widely planted as an ornamental.

Magnolia virginiana var. australis Sarg. Southern sweetbay

This tree is common along the streams throughout the pinelands of the parish.

Malus angustifolia (Ait.) Michx. Southern crab apple

Williana, Bentley, Montgomery and Prairie Formations; common; widely scattered along small stream bottoms and depressions; flowering in early March.

Manisuris tessellata (Steud.) Scribn. Jointtail grass

Prairie Formation; low open ground; occasional, scattered; flowering September into November.

Melia azedarach L. Chinaberry

This tree may be found occasionally throughout the parish, along the borders of old fields, woods margins and especially old home sites; escaped from cultivation; flowering in April.

Melica mutica Walt. Two-flower melic

Growing along shady, sandy stream banks; rare; flowering April to June.

Melothria pendula L. Wild gourd

Prairie and Recent Formations; damp woods and thickets; occasional; flowering July to September.

Monarda punctata L. Horsemint

Bentley Formation; open pine woods in dry sandy soil; occasional; flowering July to September.

Muhlenbergia expansa (DC.) Trin. Cutover muhly

Bentley, Montgomery and Prairie Formations; open pineland on moist sites; common; flowering April into November.

Muhlenbergia schreberi Gmel. Nimblewill

Moist shady places and in cultivated fields; common; flowering September into November.

Myrica cerifera L. Waxmyrtle

Montgomery, Prairie and Recent Formations; stream banks, swamps and wet pineland; common flowering late February and March.

Myrica pusilla Raf. Dwarf waxmyrtle

This shrub of the pine flatwoods may not be specifically distinct; this entity has horizontal rootstocks.

Nothoscordum bivalve (L.) Britt. False garlic

Bentley, Montgomery and Prairie Formations; open pine woods, old fields, roadsides and lawns; locally abundant; flowering March into May. This plant has become so abundant in certain areas, that it has become a troublesome weed on lawns and land devoted to truck farming.

Nothoscordum fragrans (Vent.) Kunth. False garlic

Bentley, Montgomery and Prairie Formations; open pine woods, old fields, roadsides and lawns; locally abundant; flowering March into May; a troublesome weed on lawns and in cultivated fields.

Nyssa aquatica L. Tupelogum

Recent Formation; swamps, paille fine marsh and streams. This tree was a common associate with cypress on Station No. 10 of this study.

Oenothera laciniata Hill — Evening primrose

Williana, Bentley, Montgomery, Prairie and Recent Formations; woods margins, old fields and roadsides; common; flowering April to October.

Oenothera speciosa Nutt. — Evening primrose

This plant forms large, spreading patches along roadsides and in waste places throughout the parish; flowering April to September.

Orontium aquaticum L. — Golden club

Growing in swamps, ditches, ponds and paille fine marsh; abundant in paille fine marsh, occasional elsewhere; flowering March and April.

Oxalis stricta L. — Yellow wood-sorrel

Williana, Bentley, Montgomery, Prairie and Recent Formations; open pine woods, woods margins, old fields and roadsides; common; flowering May to October.

Oxypolis rigidior (L.) C. & R. — Water-dropwort

Montgomery and Prairie Formations; open pine woods on wet sites and moist old fields; occasional; flowering September to November.

Panicum aciculare Desv. ex Poir.

Bentley and Montgomery Formations; open pine woods and old fields; common; flowering June into November.

Panicum anceps Michx. — Beaked panicum

Montgomery Formation; open woods in moist sandy soil; occasional; flowering June into August.

Panicum angustifolium Ell. Narrowleaf panicum

Williana, Bentley and Montgomery Formations; open pine woods on sandy soil; common; flowering June into November.

Panicum arenicoloides Ashe.

Montgomery Formation; open pine woods and old fields on dry sandy soil; occasional; flowering April into November.

Panicum commutatum Schult./ P. joorii Vasey

Williana and Montgomery Formations; open pine woods and old fields; common; flowering March into November. Hitchcock recognizes these as distinct species. However, the difficulties in positive identification of spring and fall material, as well as sun over shade conditions, suggests that these may not be distinct species.

Panicum dichotomiflorum Michx. Fall panicum

Recent Formation; moist ground, along streams and wet places; locally abundant; flowering September into November.

Panicum gymnocarpon Ell. Water panicum

Growing in fresh-water streams in upper, rolling hills; common in moist woody swamps; flowering September into November.

Panicum hemitomon Schult. Paille fine or maidencane

Recent Formation; ditches, swamps, margins of ponds and fresh-water marsh; very abundant locally; flowering April to June.

This grass is so abundant in the fresh-water marsh known locally

as Manchac Swamp that the area is frequently referred to as a "Paille fine Marsh." A collection of this grass was made in a roadside depression some 22 miles due north of the typical marsh habitat.

Panicum hians Ell. Gaping panicum

Prairie Formation; moist soil along ditches, streams and depressions; occasional; flowering April into June.

Panicum lindheimeri Nash.

Williana, Bentley, Montgomery and Prairie Formations; open pine woods and old fields on dry sandy soil; abundant; flowering April into November; dimorphic.

Panicum microcarpon Muhl. ex Ell.

Bentley, Montgomery and Prairie Formations; open woods, old fields, ditch banks and depressions; abundant; flowering April to November; extreme dimorphism between spring and fall collections.

Panicum polyanthes Schult.

Montgomery Formation; open pine woods on moist sites; occasional; flowering April into November.

Panicum rhizomatum Hitchc. and Chase Spreading panicum

Williana, Bentley, Montgomery, Prairie and Recent Formations; moist sandy woods, depressions and wooded ditch banks; common; flowering June to August.

Panicum scoparium Lam.

Bentley, Montgomery and Prairie Formations; open pine woods, old fields and damp sites; common; flowering June into November; extremely dimorphic.

Panicum sphaerocarpon Ell. Roundseed panicum

Bentley and Montgomery Formations; open pine woods and old fields on dry sandy soil; common; flowering June into November.

Panicum stipitatum Nash.

Prairie Formation; moist sandy sites; occasional; flowering September into November.

Panicum verrucosum Muhl.

Prairie and Recent Formations; wet, mostly shady sites; frequent; flowering September into November.

Panicum virgatum L. Switchgrass

Montgomery and Prairie Formations; open woods, ditch and stream margins; common; flowering September into November.

Panicum xalapense H.B.K.

Bentley Formation; open woods and sandy stream banks; occasional; flowering March into November.

Paspalum boscianum Flugge Bull paspalum

Prairie Formation; open pine woods in moist ground and along ditches and ponds; locally abundant; flowering June into November.

Paspalum ciliatifolium Michx. Fringeleaf paspalum

Bentley Formation; old fields, heavily grazed sites and roadsides; occasional; flowering April to September.

Paspalum circulare Nash.

Montgomery and Prairie Formations; open fields, open pine woods and roadsides; common; flowering June into November.

Paspalum dilatatum Poir. Dallis grass

Williana, Bentley, Montgomery, Prairie and Recent Formations; pastures, old fields and roadsides; abundant; flowering April to September.

Paspalum distichum L. Knotgrass

Recent Formation; ditches and depressions; common; flowering June to September. This plant appeared to be one of the pioneer species on a site which consisted of almost pure sand. Salinity tests of the soil on this site showed 0.568% soluble salts and a pH of 3.4.

Paspalum floridanum Michx. Florida paspalum

Williana, Bentley, Montgomery and Prairie Formations; pine woods, disturbed sites, road ditches and depressions; locally abundant; flowering April into November.

Paspalum floridanum var. glabratum Engelm. ex Vasey

Prairie Formation; low open ground and depressions; occasional; flowering June into November. These plants are frequently very

conspicuous because of the glaucous coating which disappears on drying.

Paspalum laeve Michx.

Bentley Formation; open woods, old fields and roadsides; occasional; flowering June to September.

Paspalum longipilum Nash.

Montgomery Formation; open woods, old fields and roadsides; occasional; flowering June into November.

Paspalum minus Fourn.

Bentley and Montgomery Formations; open fields and roadsides; occasional throughout; escaped from cultivation; flowering June to September.

Paspalum notatum Flugge Bahia grass

Williana, Bentley, Montgomery and Prairie Formations; pastures and roadsides; very abundant; one of the more common pasture grasses in Tangipahoa Parish; flowering April into November. This grass is becoming very abundant along road shoulders, either from plantings by the highway department or as an escape from cultivated fields.

Paspalum notatum var. saurae Parodi.

Prairie Formation; roadsides and fields; abundant; flowering April into November.

Paspalum plicatulum Michx. Brownseed paspalum

Bentley and Montgomery Formations; open ground and moist woods margins; fairly abundant; flowering April into June.

Paspalum praecox Walt.

Prairie Formation; low pine woods, old fields and depressions; occasional; flowering September into November.

Paspalum pubescens Muhl.

Williana, Bentley and Montgomery Formations; open pine woods, old fields and roadsides; abundant; flowering June to September.

Paspalum stramineum Nash.

Bentley and Montgomery Formations; open pine woods, old fields and roadsides; occasional; flowering June to September.

Paspalum urvillei Steud. Vasey grass

Williana, Bentley, Montgomery, Prairie and Recent Formations; along ditches, old fence rows and roadsides; abundant; escaped from cultivation; flowering April into November.

Penstemon laxiflorus Pennell Beard-tongue

Williana, Bentley and Montgomery Formations; open pine woods and old fields; occasional; flowering March and early April.

Persea borbonia (L.) Spreng. Redbay

Recent Formation; spoilbanks and margins along the marsh; locally abundant; flowering in May.

Phalaris angusta Nees ex Trin. Tall canary grass

Prairie and Recent Formations; open ground, ditches and depressions; occasional; flowering April to June.

Phalaris caroliniana Walt. Little canary grass

Williana Formation; roadsides and open ground in rolling hills; occasional; flowering April to June.

Phlox spp. Phlox

These showy flowers appear in early spring in clumps along woods margins, fence rows, roadsides and in old fields throughout the parish. Several species occur in the parish, P. pilosa L. being common; these are difficult to identify.

Phragmites communis Trin. Common reed or roseau

Recent Formation; paille fine marsh, ditches and old roadbeds along the margin of the marsh; common in large patches; panicles begin to emerge in September; spikelets mature last of October into November.

Physostegia virginiana (L.) Benth. False dragonhead

Montgomery and Prairie Formations; low woods, damp open fields and ditches; common; flowering June to September.

Phytolacca americana L. Pokeweed

Williana, Bentley, Montgomery and Prairie Formations; rich, low woods soil, disturbed ground and roadsides; occasional; flowering July to October.

Pinus echinata Mill. Shortleaf pine

Williana and Montgomery Formations; found only occasionally in the mixed pine-hardwood rolling hills.

Pinus elliottii Engelm. Slash pine

This tree is fairly abundant in the parish, but is more abundant on the wetter sites; it is widely planted but an important tree of the pine flatwoods.

Pinus glabra Walt. Spruce pine

This pine is found along the streams in densely wooded areas; it appears to occupy wetter sites than the other pines.

Pinus palustris Mill. Longleaf pine

Williana, Bentley, Montgomery and Prairie Formations; a very common tree in the pinelands of southeastern Louisiana. All the longleaf standing at present however, is second-growth resulting from natural reseeding. It is abundant throughout the parish except along stream bottoms where hardwood is predominant. It also occurs only occasionally on the Prairie Formation.

Pinus taeda L. Loblolly pine

Williana, Bentley, Montgomery, Prairie and Recent Formations; common throughout the parish, expecially on old abandoned field sites.

Plantago aristata Michx. Bracted plantain

Bentley, Montgomery and Prairie Formations; dry woods margins and roadsides in sandy soil; locally abundant; a weed of cultivated fields; flowering June to November.

Poa annua L. Annual bluegrass

Montgomery Formation; open ground, woods margins and pastures; common; flowering March into June.

Poa autumnalis Muhl. ex Ell. Sandy bluegrass

Growing along fresh-water stream banks in dense shade and in almost pure sand; frequent; flowering March to June.

Polygala cruciata L. Drum-head

Bentley and Prairie Formations; open pine woods on moist sites; occasional; flowering June to October.

Polygala incarnata L. Procession-flower

Bentley and Prairie Formations; open pine woods and old fields; occasional; flowering April into November.

Polygala nana (Michx.) Raf. Bachelor's-button

Bentley, Montgomery and Prairie Formations; open pine woods and open fields; common; flowering March to September.

Polygala ramosa Ell. Lemon milkwort

Prairie Formation; open pine woods and wet fields; locally abundant; flowering July to September.

Polygonum spp. Smartweed

Recent Formation; swamps, marsh and shallow ditches; locally abundant; flowering June to October. Several species were observed during this study.

Pontederia cordata L. Pickerelweed

Recent Formation; swamps, paille fine marsh and shallow ditches; locally abundant; flowering May to September.

Prunella vulgaris L. Selfheal

Bentley, Montgomery and Prairie Formations; woods margins, old fields, roadsides and waste places; abundant; flowering May to September.

Prunus serotina Ehrh. Black cherry

This tree is occasional throughout the parish.

Pyrrhopappus carolinianus (Walt.) DC. False dandelion

Williana, Bentley, Montgomery, Prairie and Recent Formations; old fields, woods margins and roadsides; abundant; flowering April to October.

Quercus falcata Michx. Southern red oak

Williana, Bentley and Montgomery Formations; occasional and scattered throughout the region, especially the sandy rolling hills.

Quercus marilandica Muenchh. Blackjack oak

Williana, Bentley and Montgomery Formations; this tree is common throughout the sandy rolling hills. Due to its small size, it is sometimes referred to as, "Scrub Oak." It is a common associate of longleaf pine.

Quercus phellos L. Willow oak

A common tree, scattered throughout the parish along stream bottoms, especially on the Prairie Formation where drainage is very poor.

Quercus virginiana Mill. Live oak

Prairie and Recent Formations; this tree may be observed throughout the parish, but generally, specimens north of the Prairie Formation are planted.

Rhexia alifanus Walt. Lesser meadow-beauty

Montgomery and Prairie Formations; moist pine woods and open fields; common; flowering June to August.

Rhexia mariana L. Pale meadow-beauty

Montgomery and Prairie Formations; wet pine woods and open fields; common; flowering June through August.

Rhus copallina L. Dwarf sumac

Williana, Montgomery and Prairie Formations; open woods on dry sites and open fields; common; flowering July to September.

Rhododendron canescens Sweet. Wild azalea

Prairie and Recent Formations; along stream bottoms throughout the parish; common; flowering March and April.

Rubus spp. Blackberry

Williana, Bentley, Montgomery, Prairie and Recent Formations; open woods, thickets, fence rows and roadsides; abundant; flowering March and April. Species differentiation is very difficult.

Rubus trivialis Michx. Southern dewberry

Montgomery, Prairie and Recent Formations; low ground, ditch banks and railroad embankments; locally abundant; flowering March and April.

Rudbeckia hirta L. Black-eyed susan

Williana, Bentley, Montgomery, Prairie and Recent Formations; open fields, woods margins and roadsides; abundant, flowering June to October.

Ruellia caroliniensis (Walt.) Steud. Wild petunia

Williana, Bentley, Montgomery and Prairie Formations; open pine woods, old fields and roadsides; abundant, widely scattered; flowering June to September.

Rumex crispus L. Yellow dock

Williana, Bentley, Montgomery, Prairie and Recent Formations; old fields, ditches, disturbed roadsides and lawns; abundant; flowering March into June.

Sacciolepis striata (L.) Nash.

Recent Formation; paille fine marsh and ditches along the marsh; locally abundant; flowering June to September.

Sagittaria platyphylla (Engelm.) J. G. Sm. Arrowhead

Recent Formation; swamps, paille fine marsh and shallow ditches; locally abundant; flowering June to August. This plant is a major component of the paille fine marsh.

Salix nigra Marsh. Black willow

Prairie and Recent Formations; stream banks in and near the marsh; very abundant locally; flowering February and March.

Salvia azurea Lam. Blue sage

Prairie Formation; open pine woods and old fields; occasional; flowering July to September.

Sambucus canadensis L. Elderberry

This shrub is widely distributed throughout the parish along streams, ditch banks, fence rows and pond margins; flowering March to November.

Sapium sebiferum (L.) Roxb. Chinese tallowtree

This tree is widely distributed throughout the parish. It has been introduced as an ornamental but has escaped and formed very large, dense groves. The seeds are readily eaten and distributed by birds.

Sarracenia psittacina Michx. Parrot pitcher-plant

Prairie Formation; wet pineland; locally abundant, but not as abundant as yellow pitcher plant; flowering later than yellow pitcher plant, in June and July.

Sarracenia sledgii Macfarlane Yellow pitcher plant

Prairie Formation; wet pineland; locally abundant; flowering April and May.

Sassafras albidum (Nutt.) Nees. Sassafras

This tree appears scattered throughout the parish, especially in the hardwood bottoms and along the margins of old fields; flowering in March and April.

Schrankia nuttallii DC. Sensitive-briar

Montgomery and Prairie Formations; open pine woods and old fields; occasional; flowering July to October.

Setaria geniculata (Lam.) Beauv. Knotroot bristlegrass

Williana, Bentley, Montgomery and Prairie Formations; open ground, depressions, pastures and ditch margins; locally abundant; flowering April into November.

Setaria magna Griseb. Giant bristlegrass

Recent Formation; confined to marsh and wet ditch margins along marsh; occasional; flowering September into November.

Sisyrinchium atlanticum Bickn. Blue-eyed grass

Williana, Bentley, Montgomery and Prairie Formations; open pine woods, old fields and roadsides; common; flowering March and April.

Sisyrinchium brownei Small Yellow-eyed grass

Prairie Formation; open woods, old fields and roadsides; common; flowering March and April.

Smilax spp. Greenbriers

These vines are scattered throughout the parish, especially in low woods and thickets. Several species occur in the parish. S. bona-nox L. is common. S. walteri Pursh. is found in the cypress-tupelo-gum swamp along with S. laurifolia L. Specimens of these species were not collected.

Solanum carolinense L. Horse-nettle

Williana, Bentley, Montgomery, Prairie and Recent Formations; open fields, woods margins, roadsides and waste places; occasional and scattered throughout; flowering May to October.

Solidago altissima L. Goldenrod

Recent Formation; swamp margins, ditches and roadsides; locally abundant; flowering July to October.

Solidago mexicana L. Mexican goldenrod

Recent Formation; swamp margins, shallow ditches and roadsides; locally abundant; flowering July to October.

Solidago rugosa spp. aspera (Ait.) Fern. Goldenrod

Montgomery and Prairie Formations; open pine woods margins and old fields; common; flowering August to October.

Sorghastrum elliottii (Mohr.) Nash. Slender Indiangrass

Williana Formation; margins of open woods on dry, sandy hills; occasional; flowering September into November.

Sorghastrum nutans (L.) Nash. Indian grass

Montgomery and Prairie Formations; open woods, old fields with bushy undergrowth and moist open sites; common; flowering September into October.

Sorghum halepense (L.) Pers. Johnson grass

Williana, Bentley, Montgomery, Prairie and Recent Formations; open ground, roadsides, fields and waste places; abundant; flowering April into November. A serious pest in cultivated fields.

Sphenoclea zeylanica Gaertn.

Prairie and Recent Formations; low open ground, ditch margins and paille fine marsh; occasional; flowering June to October.

Sphenopholis filiformis (Chapm.) Scribn.

Bentley and Montgomery Formations; open pine woods in dry soil; occasional; flowering June to September.

Sphenopholis obtusata (Michx.) Scribn. Prairie wedgegrass

Prairie Formation; open woods, old fields, roadsides and ditches; common; flowering April to June.

Sporobolus junceus (Michx.) Kunth. Pineywoods dropseed

Bentley and Montgomery Formations; open pine woods and ditch margins; common; flowering September into November.

Sporobolus macer (Trin.) Hitchc.

Williana and Bentley Formations; open pine woods in moist depressions; occasional; flowering July into November.

Sporobolus poiretii (Roem. and Schult.) Hitchc. Smutgrass

Williana and Bentley Formations; open ground and waste places; occasional; flowering April to September. A weed of cultivated fields.

Strophostyles umbellata (Muhl.) Britt. Wild bean

Montgomery and Prairie Formations; open pine woods and old fields; occasional; flowering July to October.

Taxodium distichum Rich. (Including T. ascendens Brongn.) Cypress

Recent Formation; swamps, marsh and along streams. Station No. 10 of this survey was formerly one of the largest virgin cypress swamps in the south. All the virgin cypress has been removed and Louisiana Cypress Lumber Company, located at Ponchatoula, Louisiana has ceased operations. According to Wilson (1956) who made a study of the Bryophytes of this area, Louisiana Cypress Lumber Company started lumbering operations in 1936 and closed down in 1960. The only remaining trees are

those which were either defective or too young to be harvested during logging operations.

Tephrosia virginiana (L.) Pers. Goat's-rue

Williana, Bentley, Montgomery and Prairie Formations; open woods, old fields and roadsides; occasional throughout; flowering April to June.

Tridens ambiguus (Ell.) Schult. Pinebarren tridens

Bentley, Montgomery and Prairie Formations; open woods and cutover pineland; common; flowering June into November.

Tridens flavus (L.) Hitchc. Purpletop

Williana Formation; open pine woods and old field margins; frequent; flowering September into November.

Tridens strictus (Nutt.) Nash. Long-spike tridens

Occupies ditches and moist roadsides; occasional; flowering September into November.

Trilisa odoratissima (Walt.) Cass. Vanilla-plant

Montgomery and Prairie Formations; low open pine woods; occasional; flowering July to September.

Tripsacum dactyloides (L.) L. Eastern gamagrass

Growing on moist ditch bank near an old homesite; rare; flowering September and October.

Typha latifolia L. Common cat-tail

Recent Formation; swamps, paille fine marsh and shallow ditches; very abundant locally; flowering in May. A major component of the paille fine marsh.

Uniola laxa (L.) B.S.P.

Williana, Montgomery and Prairie Formations; ditch banks and stream bottoms in shady woods; occasional; flowering September into November.

Vaccinium elliottii Chapm. Elliott's blueberry

Montgomery Formation; open pine woods, thickets and stream bottoms; occasional; flowering March and early April.

Vaccinium myrsinites Lam. Darrow's evergreen blueberry

Montgomery and Prairie Formations; open pine woods and cutover pineland; common; flowering May to June.

Vaccinium stamineum L. Squaw-huckleberry

Bentley and Montgomery Formations; dry woods, thickets and stream bottoms; occasional; flowering March and April.

Verbena bonariensis L.

Prairie and Recent Formations; swamp margins, ditches and roadsides; locally abundant; flowering May to September.

Verbena littoralis H. B. K.

Prairie and Recent Formations; swamp margins, ditches and roadsides; locally abundant; flowering May to September.

Verbena rigida (L.) Spreng.

This plant forms large, spreading patches along roadsides and in waste places throughout the parish; flowering June to September.

Vitis rotundifolia Michx. Muscadine

This vine is scattered throughout the parish along streams and in thickets; flowering in June.

Viola spp. Violets

Prairie and Recent Formations; several species of violets were observed throughout the parish in open woods, old fields and roadsides; flowering March to June.

Zizaniopsis milacea (Michx.) Doell. and Aschers. Water millet or cut-grass

Recent Formation; marsh, stream banks and ditches; very abundant locally; flowering April to June.

DISCUSSION

The annotated catalog represents a collection of approximately 1800 specimens. The list contains 262 species, 118 of which are grasses, from Tangipahoa Parish, Louisiana. This supports the claim made by William Darby in 1817, when he wrote that Louisiana had a great variety of meadow grasses. Truly, grasses as well as a great variety of forbs, shrubs and trees do abound throughout the area of this work.

The stations chosen for study in this work do not have all the micro-habitats and do not include all the species that may be found on the broad extent of all formations throughout Southeast Louisiana.

The early settlers considered pineland as very poor land compared to magnolia-cane land. Possibly this was true during the early days when this country was first settled. Much of the pineland during this time, especially on the Prairie Formation, was poorly drained and the poorest land of all, was referred to as "crawfish land." This was piney woods land which had an abundance of "crawfish chimneys" or "stools," due to the abundance of moisture and the high clay content of the soil.

Today, it would probably be more appropriate to refer to the pineland as being less productive than the magnolia-cane land, for certain types of farming. Cutover pineland in this area which has adequate drainage and proper fertilization-liming practices, produces

some of the best dairy and beef cattle farms in the state. Most of the milk shipped into the New Orleans milkshed is produced in this area. Also, truck farms which produce strawberries and a variety of vegetable crops such as sweet pepper, beans, cucumbers and squash abound on certain areas of the Prairie Formation. In addition, much of the pineland which has been properly managed has become a very profitable source of timber for pulpwood, sawlogs and piling.

Longleaf pine is found on all four geological formations, but the Prairie Formation produces a much greater abundance of hardwood. Hardwood also abounds on the Recent sites, with the addition of cypress.

It is of interest to note that a number of works have been published in regard to the longleaf pine-bluestem range. Bluestem which is one of the common names applied to a variety of species within the genus Andropogon is a very common associate of the longleaf pine. They provide very lush ground cover throughout the pinelands of Southeastern Louisiana. Eleven species of bluestem were collected on all formations. It should be noted that Andropogon gerardi, A. elliottii, A. subtenuis, A. ternarius and A. tracyi appear to occupy the drier, more sandy sites; while Andropogon virginicus becomes more abundant on soils with a higher moisture content, A. glomeratus flourishes on still wetter sites.

It appears that this part of Louisiana produces three peak seasons for grasses instead of the conventionally recognized two. These seasons could be classified as spring, summer and fall. The earliest flowering

date recorded for grasses was late February and the latest was mid-November.

Certain species of Panicum, Eragrostis and Digitaria were predominant in the spring flora with the Paspalums being most abundant in late spring on through summer. Andropogon, Aristida and Erianthus comprised the greater portion of the fall flora. Many species of Panicum bloomed throughout the year and a large number exhibited dimorphism which made identification very difficult.

Several differences relative to plant distribution and geological formation were noted. Some of these differences are real whereas others are apparent. For example, Agrostis perennans was found only on the Williana Formation. However, collections in the herbarium indicate that it has been found on the other formations also. Some of the apparent differences are due to random sampling over a large area which results in the possibility of overlooking some of the less abundant species.

There appears to be a direct correlation between the distribution of certain species and the geological formations, which is indirectly related to the moisture content of the soil. There is a general decrease in slope from Williana, the oldest formation, to Prairie, which is the youngest. As the degree of slope decreases, the amount of moisture increases. Therefore, the youngest formation retains the greatest amount of moisture. The wettest sites of all are found on the Recent

Formation. This oftentimes takes on the form of swamps, stream margins and ditches. This is one of the factors which sometimes presents a problem in correlating plant distribution with geology. A rim swamp or small rim stream is frequently associated with a change from one geological formation to the next. Thus, it is quite common to find plants indicative of Recent or Prairie Formations growing on selected sites of older formations such as Williana or Bentley. However, these plants are invariably associated with a rim swamp or meandering stream. A case in point is the collection of paille fine, Panicum hemitomon, 22 miles north of the paille fine marsh. This is a typical marsh plant and a good indicator of the marsh type habitat. Yet, the northernmost collection was from an area that can be positively identified as Montgomery Formation. However, this community of paille fine, even though surrounded by Montgomery Formation, was growing in a depression which was associated with a small intermittent stream. It should be remembered that the deposition and eroding of parent material during the period of the glaciers produced a very irregular pattern along the land surface.

Another example of a rim swamp or bog-type habitat is found on Station No. 8. This area is located on the Prairie Formation where it drops off from the Montgomery Formation. The more common grasses on this site are certain species of Eragrostis, Panicum, Agrostis, Paspalum, Axonopus, Andropogon, Aristida and Ctenium. Manisuris tessellata was collected only from this site. There are other plants

found on this site which are generally absent on the older formations such as yellow pitcher plant, Sarracenia sledgii; parrot pitcher plant, S. psittacina; dwarf-sundew, Drosera brevifolia; foxtail clubmoss, Lycopodium alopecuroides var. pinnatum; golden colicroot, Aletris aurea; false aloe, Agave virginica; star-rush, Dichromena colorata; and button-rod, Eriocaulon decangulare. Even though these plants occur on the Prairie Formation elsewhere in the parish, they are in greater abundance on this site than on any other location.

Generally, vegetation appearing on the Williana, Bentley and Montgomery Formations was very similar. It appears that there are no outstanding differences in species distribution on these formations. The same species occur on all three formations, but a given species may be more abundant on a particular site.

When the older formations (Williana, Bentley and Montgomery) are grouped and species distribution is compared to the younger formations (Prairie and Recent), 51 per cent of the species are found on the younger formations as compared to 49 per cent on the older formations, with 27 per cent of the species being common to both groups. Further analysis shows that 22 per cent of the grasses are confined to the older formations with 24 per cent being distributed among the younger formations while 5 per cent of the species are restricted to the Recent sites only.

The most distinguishing differences in vegetational features occur between the older formations and the Prairie, and between the Prairie Formation and the Recent. The drop-off from the Prairie Formation to the Recent forms a habitat where cypress and tupelogum abound. In addition there are several grasses which are excellent indicators of the typical swamp, fresh water marsh habitat. For example, water panicum, Panicum gymnocarpon is a rank-growing, coarse-leaved grass which is abundant in intermittently flooded cypress swamps. It is not found in the pinelands. Other grasses present in the fresh water marsh but absent in the pinelands are roseau, Phragmites communis which forms large patches, oftentimes expanding into large communities, throughout the vast area known as Manchac Swamp and water millet, Zizaniopsis milacea which is very abundant along the margins of streams, ditches and shorelines in the marsh. Sacciolepsis striata which forms a wide band extending all along the irregular shoreline of the marsh and giant bristlegrass, Setaria magna, a robust grass which is confined to the wet margins of the marsh are also present. It appears that the restriction of these species to Recent areas is due more to moisture relationships than any other factor.

SUMMARY

The object of this study was to investigate the correlations between plant distribution, in particular the grasses, and the geological formations within Tangipahoa Parish, Louisiana, and to assemble an annotated catalog of plants occurring on selected sites within the Parish.

Five geological formations can be identified within the bounds of this study, namely: Williana, Bentley, Montgomery, Prairie, and Recent. The most conspicuous break in distribution of vegetation occurs between the older formations (Williana, Bentley, and Montgomery) and the Prairie, and between the Prairie and the Recent. Even though longleaf pine is abundant on all four of the formations, the Prairie Formation contains a much greater abundance of hardwood species. The Recent Formation which is the youngest as well as the wettest of the five formations studied, possessed species which are indicative of swamp or marsh type habitats.

The annotated catalog lists 262 species of plants with pertinent field notes and data related to the geology of Tangipahoa Parish.

The annotated catalog contains 118 species of grasses with a separate table showing the distribution of grasses according to geological formations.

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Figure 14. An abundance of tall bluestem in the foreground with a background of pine on Station No. 1 of the Williana Formation.

Figure 15. Dense growth of broomsedge, Andropogon scoparius running four to five feet high on Station No. 1 of the Williana Formation.

Figure 14

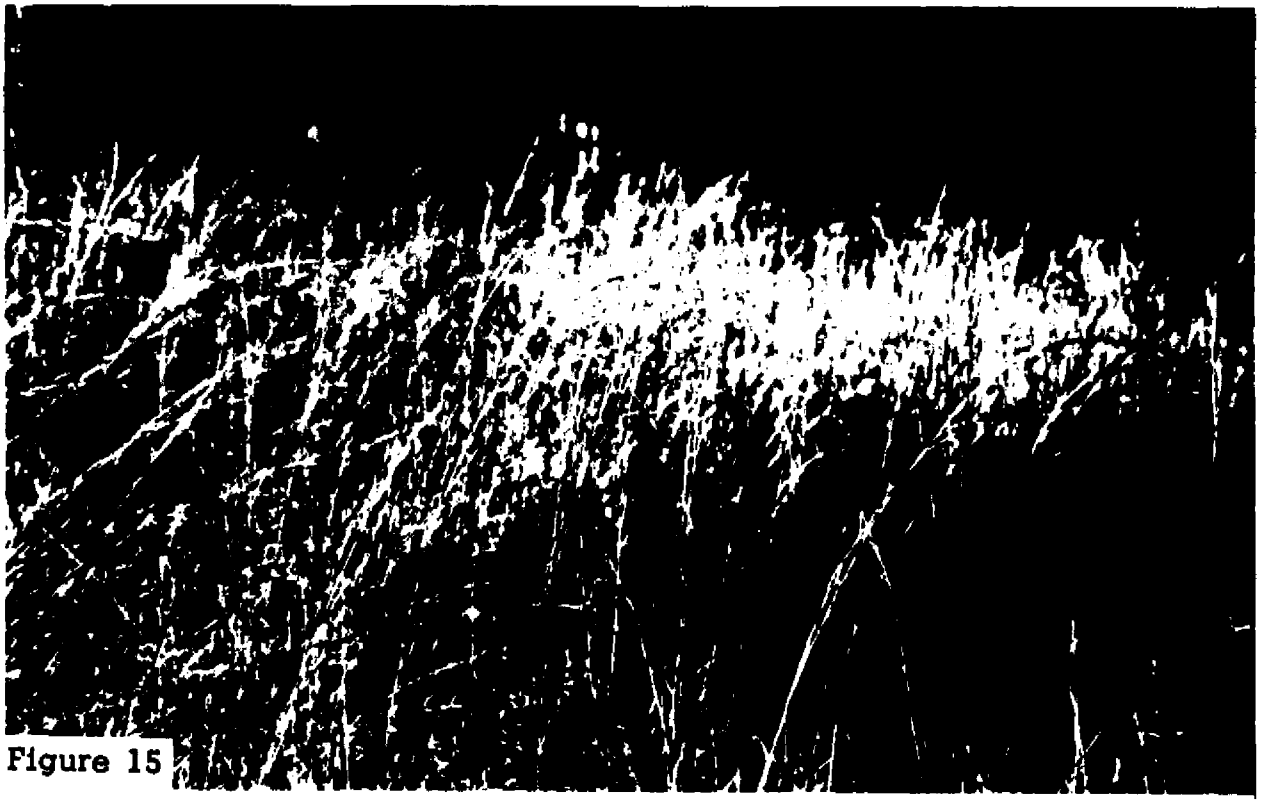

Figure 15

Figure 16. Typical longleaf pineland east of Tangipahoa, Louisiana on Station No. 2 of the Bentley Formation. Slender bluestem, Andropogon tener is the predominant grass with a mixture of longleaf pine and blackjack oak in the background. Aristida is also common on this site.

Figure 17. The early surveyors described large portions of this region as, "poor rolling pineland." Today however, land devoted to beef and dairy cattle production is a common sight throughout the rolling hills. The foreground shows a field of the imported bahia grass which has been cut for hay. In the background is a field planted to rye grass for winter pasture.

Figure 16

Figure 17

Figure 18. Little bluestem is very common on the rolling hills where pine is the dominant tree type. Pines were able to invade this site in spite of a dense stand of little bluestems. Station No. 3 of the Bentley Formation.

Figure 19. Aristida oligantha is an abundant grass on road shoulders, a disturbed habitat, through longleaf pineland on the Bentley Formation.

Figure 18

Figure 19

Figure 20. An overgrazed site (Station No. 4 of the Bentley Formation). Weeds such as blackberry and yankeeweed are common. Broomsedge and poverty grass comprise the major cover, but note the sparsity due to overgrazing. Pines are predominant in the upperstory with a few scattered Chinese tallow trees.

Figure 21. Station No. 5 of the Montgomery Formation which has been protected from fire. The grasses are an understory to longleaf pine. Note the abundance of broomsedge and the heavy litter on the forest floor. Several fall-flowering panicums were collected on the disturbed soil of the fire lane.

Figure 20

Figure 21

Figure 22. A second growth stand of pine on the Montgomery Formation, surrounded by a wide fire lane for protection. Bluestems and panic grasses make up a greater portion of the understory vegetation, and are especially abundant in the roadside ditch.

Figure 23. Bluestem, Andropogon gerardi growing in the open areas among longleaf pine trees on Station No. 6 of the Montgomery Formation.

Figure 22

Figure 23

Figure 24. A tung plantation on the Montgomery Formation on the eastern side of Tangipahoa Parish. Note the rolling topography of the land in this area. Tung production was formerly a large industry in this part of the country but much of this land is now being cleared and planted to pasture crops for cattle production. Bluestems, panic grasses and some bahia are common grasses on this site.

Figure 25. Dense undergrowth of broomsedge, blackberry, and yankeeweed on Station No. 7 of the Montgomery Formation. Several of the panic grasses were also abundant on this site.

Figure 24

Figure 25

Figure 26. This area to the left of the fire lane was not burned whereas that to the right was burned, a common practice. Range cattle were observed grazing the burned area more frequently than the nonburned area.

Figure 27. A typical view of Station No. 8 in the longleaf pine flatwoods of the Parish Formation. There was an abundance of bluestems, panic grasses, and paspalums with interspersed clumps of wax myrtle. The light colored row marks the fire line in the background.

Figure 26

Figure 27

Figure 28. A small community of pines has developed from a very few older trees which can be seen in the background. A few pines were the only trees remaining on this site after it was cleared for the construction of an air base during World War II. Broomsedge, Andropogon virginicus, is the dominant fall vegetation on the open areas of the Prairie Formation. Axonopus affinis is also abundant on this site.

Figure 29. A thick cover of Andropogon virginicus on Station No. 9 of the Prairie Formation. Creep grass makes up the predominant spring grass flora on this site.

Figure 28

Figure 29

Figure 30. Paille fine marsh in Manchac Swamp. The canal cuts through a marsh composed of paille fine, cat-tail, paddle weed, and pickerelweed. Trees in the background include cypress, swamp blackgum, and tupelogum. There are also several colonies of roseau in this marsh.

Figure 31. The south side of the "spoil bank" on Station No. 10 of the Recent Formation, Willows and blackberry briars were very abundant on the "spoil bank." The marsh proper is composed of paille fine, cat-tail, paddle weed, and pickerelweed.

Figure 30

Figure 31

Figure 32. Zonation of North Pass. Alligator weed is growing in the water of the canal, followed by water millet, followed by swamp type shrubs such as wax myrtle, swamp bay, marsh-elder, and eastern baccharis. Cypress and tupelogum of the swamp can be seen in the background.

Figure 33. A large colony of roseau, Phragmites communis growing on an abandoned roadbed through the marsh. Cypress in the cypress-tupelogum swamp can be seen in the background.

Figure 32

Figure 33

Figure 34. Backfill on Station No. 11 of the Recent Formation. The backfill is almost pure sand with most of it still bare of vegetation. Clumps of bluestem, wax myrtle, and live oak seedlings can be seen in the foreground. The surrounding background vegetation consists of willow, swamp bay, wax myrtle, marsh-elder, eastern baccharis and young live oaks on the higher banks.

Figure 35. Alligator weed in the water with large clumps of water millet at the waters edge. The willow fringe of the cypress-tupelogum swamp can be seen in the background. This scene was taken at North Pass, two miles north of Pass Manchac.

Figure 34

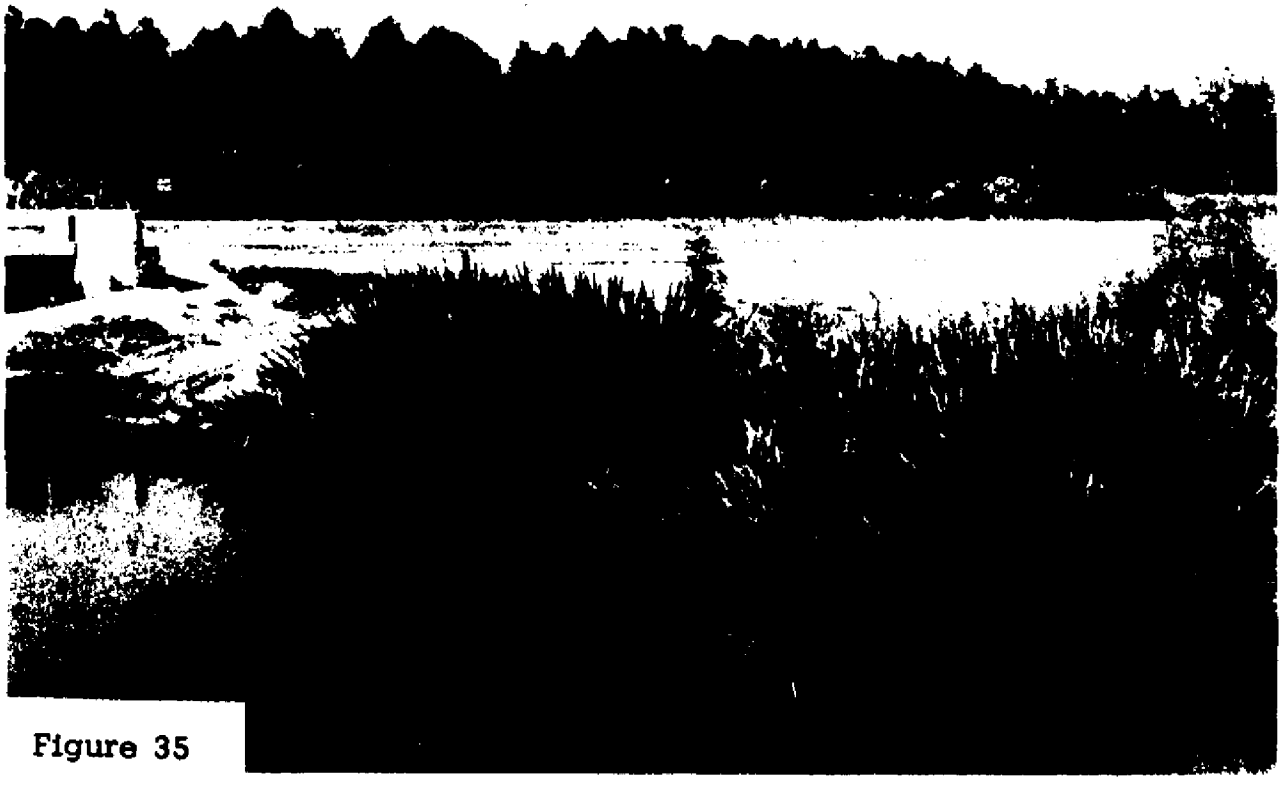

Figure 35

Figure 36. A. An expanded and unexpanded inflorescence of bushy beardgrass, Andropogon glomeratus, locally called broomsedge.

B. A panicle of roseau, Phragmites communis.

C. Giant plumegrass, Erianthus giganteus, which is common in ditches and depressions of the Recent Formation.

D. A clump of Andropogon glomeratus, growing in almost pure sand at Station No. 11. Inflorescence not expanded.

Figure 36

Figure 37. Giant cane, Arundinaria gigantea. Old, woody culm (A) and suffrutescent culms (B) growing from the same rhizome. These culms also flowered simultaneously (See Figure 38).

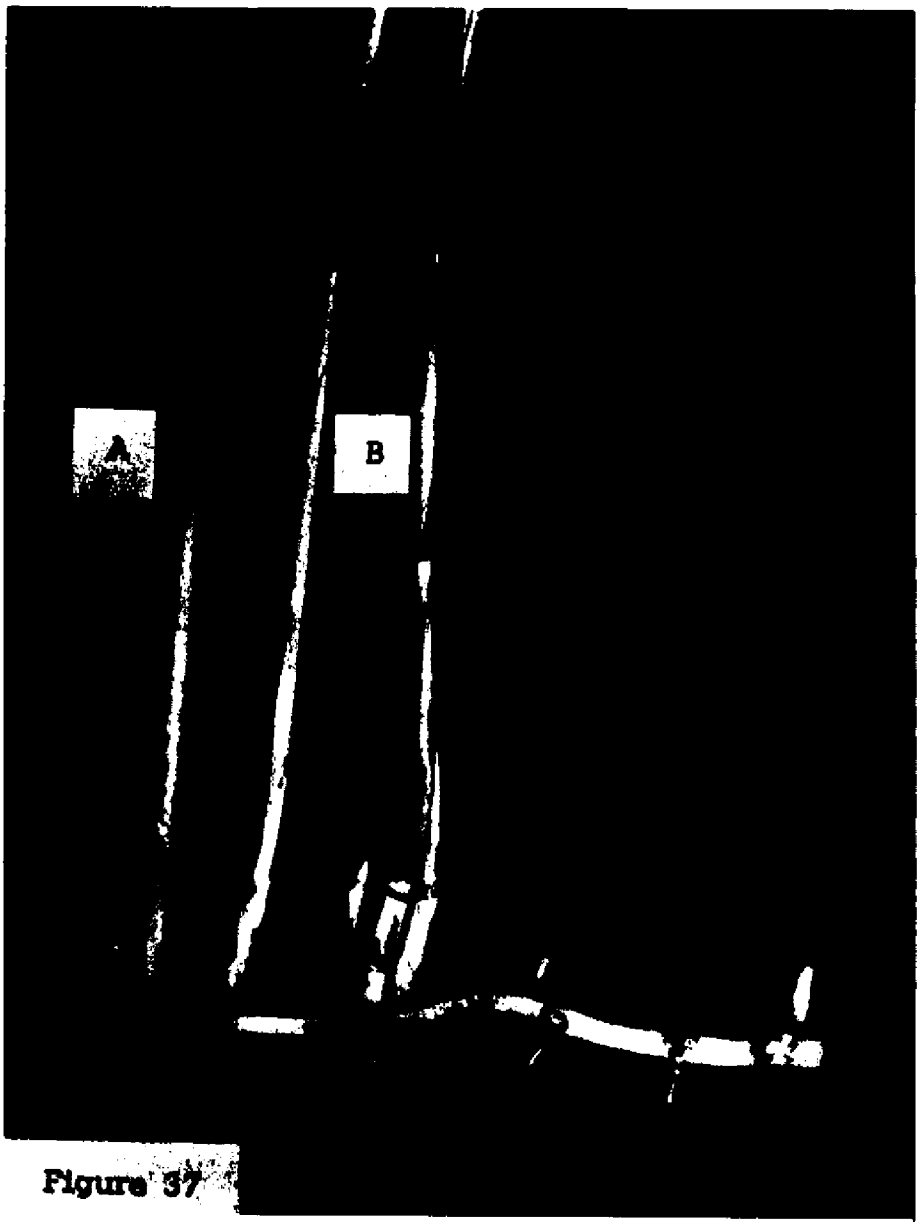

Figure 37

Figure 38. Spikelets of giant cane, Arundinaria gigantea, produced on upright, suffrutescent culm (B) and on old, woody culm (A) simultaneously (See Figure 37). Both types of culms were growing from the same rhizome.

Figure 38

VITA

Earl Ray Wascom was born in Corbin, Louisiana on November 26, 1930. He was graduated from Walker High School in 1947. His undergraduate studies were interrupted at the end of three years, when he left Southeastern Louisiana College to serve in the United States Navy. He was honorably discharged from the navy, returned to the college, and received the Bachelor of Science degree in May 1956.

He joined the faculty of Southeastern Louisiana College at Hammond in 1958, as Instructor of Biological Sciences. He attended the University of Colorado at Boulder during the summer of 1959 for advanced study. He enrolled at Louisiana Polytechnic Institute in the summer of 1960 where he received the degree of Master of Science in Botany in May 1962.

He was granted leave from Southeastern Louisiana College in September 1965 to continue graduate work at Louisiana State University. He is a candidate for the degree of Doctor of Philosophy, in August 1967.

EXAMINATION AND THESIS REPORT

Candidate: Earl Ray Wascom

Major Field: Botany

Title of Thesis: A Comparative Ecological Study of the Grasses and the Geology of Tangipahoa Parish, Louisiana

Approved:

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

Date of Examination:

July 19, 1967